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UNITED STATES PUBLIC HEALTH SERVICE

PUBLIC HEALTH ADMINISTRATION IN MARYLAND

A STUDY OF THE STATE DEPARTMENT OF
HEALTH AND OTHER AGENCIES HAV-
ING SANITARY FUNCTIONS

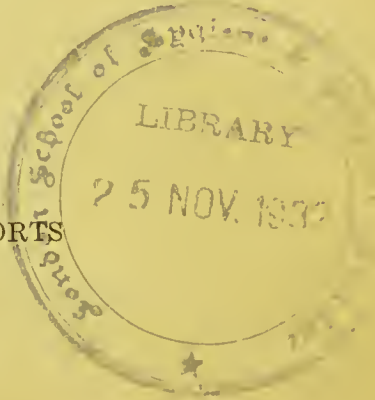
BY

CARROLL FOX

Surgeon, United States Public Health Service

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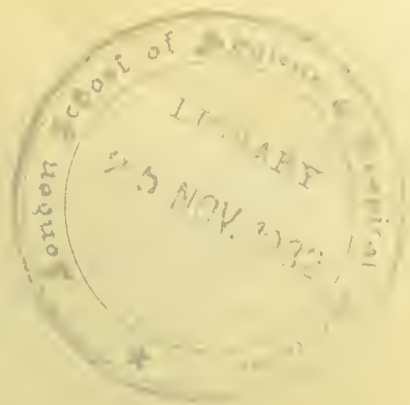
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PUBLIC HEALTH ADMINISTRATION IN MARYLAND.¹

A STUDY OF THE STATE DEPARTMENT OF HEALTH AND OTHER AGENCIES HAVING SANITARY FUNCTIONS.

By CARROLL FOX, Surgeon, United States Public Health Service.

The Federal, State, and local governments are so closely related in public health matters as to make it highly desirable for each to have full knowledge of the organization, powers, and duties of the others under law, and the extent to which these powers are being exercised. Such knowledge will prevent duplication of effort, conduce to more thorough cooperation, and stimulate to greater uniformity in public health administration.

The act of February 15, 1893, authorizes the Public Health Service to examine State and local laws and regulations for the prevention of the introduction and spread of contagious diseases, and the act of August 14, 1912, contains authority for investigations of sanitation. Under the former provision, an analysis has previously been made by Kerr and Moll of laws and regulations in respect to the organization, powers, and duties of State and local health authorities, and the results published.² These authors have also made an analysis of the State laws and regulations relating to the control of communicable diseases.³

It was logical to undertake a closer study of public health administration under these laws, and an invitation of the State Board of Health of Maryland afforded an excellent opportunity. The work of which this report contains the results was begun in July, 1913, and continued for a period of approximately six months. During this time studies were made of the organization and operations of the Maryland department of health and its controlling body, the State board of health, and the health machinery of counties in different parts of the State.

The work was greatly facilitated by the officers of the respective departments and health officers visited. Acknowledgments are due and here made to these officers for their uniform courtesies, and especially to Dr. John S. Fulton, secretary of the State board of health.

STATE DEPARTMENT OF HEALTH.

The State department of health was reorganized in conformity with chapter 560 of the act of 1910 (see. 21h, art. 43, of the Public General Laws of Maryland) from the then existing "State board of health."

¹ Reprint from the Public Health Reports, vol. 29, No. 5, Jan. 30, 1914.

² Public Health Bulletin 54.

³ Public Health Bulletin 62.

The State department is divided into the board of health, the ruling body; the executive office, in charge of the secretary of the board, who is also executive officer; the clerical division, in charge of the chief clerk of the department; the division of foods and drugs, in charge of the State food and drug commissioner; and the bureaus of communicable diseases, sanitary engineering, vital statistics, chemistry, and bacteriology, each in charge of a bureau chief.

State Board of Health.

Membership of the board.—Section 1 of article 43 of the Public General Laws of Maryland provides that the State board shall be composed as follows: Four members, one of whom shall be an experienced civil engineer, and three of whom shall be experienced physicians, to be appointed by the governor, with the advice and consent of the senate; a secretary, elected by the board, who shall be an educated physician and experienced in sanitary science and who shall be executive officer of the board as well as a member; the attorney general for the State; and the commissioner of health of Baltimore City.

Tenure of office of members.—The secretary holds office as long as he faithfully discharges the duties thereof. He may be removed for just cause at a regular meeting of the board. The term of office of the other appointive members is four years. The law provides that every two years the term of office of two of the appointive members shall expire and that then two other members shall be appointed to fill their places. (Secs. 1 and 5, art. 43.)

Meetings.—The board is required to meet quarterly in the city of Baltimore, and at such other times and places as they shall appoint. Under this authority the board meets on the first Thursday of each month in the city of Baltimore, a majority being necessary to constitute a quorum for the transaction of business.

Salaries and expenses.—The secretary receives \$2,500, other members of the board \$5 per day for each day's attendance at a meeting of the board. The secretary and members of the board receive actual and necessary traveling expenses. (Secs. 5 and 20, art. 43.)

Powers and duties of the board.—By legislative enactments the State board is given rather broad general powers in respect to its internal administration and public health matters within the State.

These powers and duties are summarized from the laws as follows:

1. To have general care of the sanitary interests of the people of the State.
2. To make sanitary investigations and inquiries respecting the causes of diseases, and especially epidemics, the causes of mortality, and the influence of locality, employments, habits, and other circumstances and conditions upon the health of the people.
3. To inquire into and investigate all nuisances affecting the public health.
4. To abate such nuisances by applying to the court for an injunction. (Sec. 2, art. 43.)
5. To elect a president from among their members and a secretary to be executive officer. (Secs. 3 and 4, art. 43.)

6. To organize in any city, village, or legislative district, local boards or advisory committees to serve without pay.

7. To send their secretary or a committee to any part of the State to investigate any unusual sickness or mortality.

8. To take all needful sanitary measures and precautions in emergencies.

9. To adopt all needful rules and regulations subject to the provision of this act. (Sec. 3, art. 43.)

10. To take such action and adopt and enforce such rules and regulations as will prevent the introduction of communicable diseases into the State. Penalty for disobeying any such rules and regulations—a fine of not more than \$500 for every such offense.

11. To call a public conference of health officers whenever necessary, or to send a delegate to any conference of local, State, or national health officers. (Sec. 21, art. 43.)

12. To decide questions arising between local boards as to their jurisdiction or their relative duty in the abatement of any particular nuisance. (Sec. 12, art. 43.)

The State board of health early devoted its attention to the investigation of the prevalence and causes of diseases and their suppression, and to the registration of births and deaths. The urgent need of a chemist soon became manifest, and provision was made for the employment of such an official in 1887. Ten years later the equipment of a bacteriological laboratory was recommended, and the work was begun in June of the following year (1898). In 1910 the work of the board was organized into bureaus, systemizing its performance and enlarging its sphere of usefulness. The number of employees was also materially increased.

From the foregoing it is seen that the State board of health has been merged into a department in which, however, it retains the executive control and quasi legislative powers. Since the board does not sit constantly, however, in the interim of meetings the duties arising must be performed by the executive officer of the department. At least theoretically, therefore, the responsibility and the power of initiation to meet emergency does not appear to rest squarely enough on the administrative official whose duty it is to handle the executive work.

Furthermore, by reason of the method of appointments on the State board of health it would be possible at any time for its personnel to be so changed for political reasons as to include members without the necessary knowledge of public health needs. While the present board is composed mainly of men of eminence in public health matters, who support the secretary in his actions, it might at times become political at the will of the governor of the State.

Generally speaking, State boards of health by reason of their organization and slow moving methods are not in position to exercise all the functions which should be required of a department of health. The State department of health should be able to act quickly and efficiently, and in my opinion this can best be accomplished when it is presided over by an all-time health official who

has as his subordinates a sufficient number of capable bureau chiefs and a board or council composed of public officials, business and professional men to act in an advisory capacity only. This officer should have the power of initiation and he should have as a part of his department an adequate county or district health organization which should be subject to the control of the State department and work under it for the prevention of disease and the improvement of the public health.

It would appear to be the modern tendency to place organizations such as departments of health under the control of one head, as instanced in the States of New York, Pennsylvania, and in the Philippine Islands.

The Executive Office.

The executive office is located in the headquarters of the department at No. 16 West Saratoga Street, Baltimore, Md. The personnel of this office and their respective annual salaries are as follows:

| | |
|--------------------------------------|----------|
| Secretary and executive officer..... | \$2, 500 |
| General counsel..... | 1, 500 |
| Special counsel..... | 1, 200 |
| One stenographer..... | 780 |
| One telephone clerk..... | 360 |

6, 340

THE SECRETARY OF THE DEPARTMENT.

The secretary of the State board is one of the not-too-many-all-time State health officers. He spends his entire time in his office attending to official matters. Judging from the salary paid, this would not be expected of him, as certain of the bureau chiefs who are receiving as much are not required to devote all of their time to official work. That the salary paid is rather small for the service rendered may be readily appreciated from a glance at the following table, which shows salaries paid to officials in similar positions in other States:

| | |
|--------------------------------|----------|
| Ohio..... | \$3, 500 |
| Ohio, assistant secretary..... | 3, 000 |
| Rhode Island..... | 3, 000 |
| Pennsylvania..... | 10, 000 |
| Massachusetts..... | 5, 000 |
| Indiana..... | 3, 000 |
| California..... | 3, 600 |
| Louisiana..... | 5, 000 |
| Wisconsin..... | 3, 000 |
| Washington..... | 3, 600 |

Of the above it must be remembered that not all are required to devote their entire time to the duties of secretary, but are permitted to take private practice or occupy some teaching position in local universities.

In those States of which there is a record at hand, the following pay the same salary as the State of Maryland: Michigan, New

Jersey, and Kansas. In the latter instance, the secretary is also dean of the Kansas University medical department, and as such receives \$4,000 in lieu of any other salary from the State; therefore, the salary of secretary remains undrawn.

Duties of the secretary.—The duties of the secretary as specified by law may be summarized as follows:

1. To keep a record of the transactions of the board and an account of all expenditures.
2. To correspond and consult with other boards and with local boards of health to secure an interchange of useful information.
3. To keep a record of correspondence of all reports received from such boards.
4. To prepare necessary blank forms and forward them to the several local boards of health around the State.
5. Upon request of local boards to visit their districts and investigate the cause of any existing diseases.
6. To make special investigations of public hospitals, asylums, etc.
7. To advise in regard to the location of drainage, etc., of any public institution or building belonging to the State.
8. Through the annual report or otherwise to disseminate information among the people. (Sec. 5, art. 43.)
9. To collect information concerning vital statistics and to act as State registrar of vital statistics. (Secs. 5 and 6, art. 43.)
10. During the existence of any epidemic or unusual sickness or mortality to co-operate with and aid the local health authorities in making scientific and practical investigations into the cause or causes of any existing diseases and in advising the most efficient means for its restriction or its suppression. To this end he may exercise all of the powers of the State board of health. (Sec. 29, art. 43.)

As executive officer of the board of health, the governing body, it is the duty of the secretary to see that the wishes of the board are carried out. Being subordinate to the board, he can take the initiative only under certain conditions of emergency, although it must be repeated that the present board will and does support any action taken by its secretary. Ordinarily, however, his actions must be approved by the board.

Many men occupying such a position would prefer to defer action awaiting instructions from the board which means delay, as some boards do not meet even once a month. Public-health work, above all others, requires that some one shall be on duty all the time, and the person or persons who act in the authoritative capacity should be within reach at least during all reasonable hours. It would be manifestly ill advised to employ seven controlling heads to be present all the time, and it seems equally ill advised to employ seven controlling heads to meet at lengthy intervals, while the man who is ready to take action at all times is without that supreme authority necessary to secure prompt and efficient results.

Not the least important duty of the secretary, acting as executive officer, is to coordinate the work of the different bureaus comprising the department, and by exerting a controlling and directing influence

to secure cooperation among the bureaus and thus accomplish the best results from the operations of the department. Without such an influence, each bureau chief is apt to consider that his work is the only important work in the department.

All reports from bureau chiefs should be made to the secretary, and no information contained in these reports should be made public until released by him. Otherwise, it will not infrequently happen that a report may be made by the chief of one bureau relating to a subject regarding which another bureau has already expressed an opinion. It is necessary for the secretary to determine that the two opinions do not conflict and therefore will not bring discredit on the department after publication.

Another important duty of the secretary is to originate or collect ideas for the approval of the board, which, when put into effect, will play some part in the advancement of public health.

ATTORNEYS FOR THE DEPARTMENT.

There are two attorneys appointed as the legal advisors of the board of health in addition to the attorney general for the State, who is a member of the board. He, however, rarely attends meetings of the board and is seldom asked to express any opinion.

Of the two attorneys who are employed, one is known as the special counsel and receives \$1,200 a year; he has little to do as there is not sufficient legal work for two attorneys. The other, who is known as the general counsel, receives \$1,500 a year and attends to most of the legal work of the department.

The duties of the attorneys are not defined by law. The general counsel attends board meetings, gives advice relative to legal procedures, gives interpretations of existing laws, draws up proposed legislation, files complaints with the State's attorney, acts in court as attorney for the board, or assists the State's attorney in trying cases, and is a member of the board which gives hearing in cases of suspected violation of the food and drugs act.

OFFICE HOURS OF THE DEPARTMENT.

Except in the chemical laboratory, the office hours are from 9 o'clock a. m. until 4 o'clock p. m., with one hour for lunch. This means a day of but six working hours. In the chemical laboratory the hours of from 9 until 5 are observed, making a day consist of seven working hours. On Saturday the department closes at 1 o'clock during the entire year.

The question of lengthening office hours is now under consideration, but it would seem reasonable on general principles and practices to require that for office employees a day consist of seven working hours, while for those in the field where work is not confining, eight

working hours should not be too much, with the understanding that any bureau chief in emergencies may, with the approval of the secretary, require overtime from any or all of the employees working in his bureau.

Exactly which hours of the day or the night are to be devoted to work depends upon the nature of the employment or the exigencies of the service. It should be within the powers of the bureau chief to grant permission to an employee to occasionally leave earlier than usual when by so doing official work will not be interfered with.

The State department does not require that its chiefs of bureaus shall conform to any stated hours in the performance of their official duties, so that while some of the chiefs may be found in their offices, or otherwise engaged in official work, during a full daily period, others perform their duties in a few hours. Where officials are employed in schools or colleges as professors or instructors on subjects for which by reason of their line of work they are especially fitted, the time absent while engaged in such outside work might well be considered as an absence on account of official duties, so long as such duties take but a small part of their time. Men who occupy such positions are advancing the interest of public health and sanitation.

No compensation for overtime, either as extra pay or extra vacation is allowed, nor does it seem to be necessary that such should be the case. The length of time that should be given for eating lunch is a matter of opinion, some States allowing an hour, or even an hour and a half, while in other States, a half hour is deemed sufficient.

During the year three weeks' leave of absence is allowed to each employee with full pay.

THE ANNUAL REPORT.

A perusal of the annual report for 1912 discloses the fact that there is much in it which could well be left out without curtailing its value. The essential object of such a report should be to record the transactions of the department in relation to time and their legal bearing and to present a summary of the progress of public-health work. The main facts reported by the different chiefs of bureaus should be incorporated into the report of the secretary and reports from the chiefs of bureaus should be condensed and summarized.

For instance, in the report referred to 37 pages are taken up by the reports from county and town boards of health and town health officers. Many of these reports are valueless, and many local jurisdictions are not reported upon at all. This simply indicates the lack of control which the State department has over them. It would seem best to leave out altogether, or include brief summaries of any pertinent facts contained in them in the secretary's report. Sixty-four pages of the report are taken up with the details of sanitary

surveys and investigations. These could well be condensed and presented in the form of summaries.

The account of the prevalence of communicable diseases as given under the heading, "Bureau of communicable diseases," takes up 68 pages. The account is in the main somewhat complicated and confusing. The subject is important and might with advantage be recorded in such a manner as to be more readily comprehended.

A financial report should be included.

It would be quite possible to greatly reduce the size of the annual report, not only reducing the expense for printing thereby, but also making it more valuable, in that much would be left out that now disheartens the reader in attempting to get the facts, while at the same time these facts would be very much clearer.

The present volume is so large that the money appropriated for its publication, namely, \$500, does not cover the expense of printing, and the difference has to be made up from funds of the department. Furthermore, it is not possible to have a fewer number published, as the law requires that 2,000 copies shall be issued, and the comptroller has ruled that unless 2,000 are obtained he will not approve the bill for printing.

It would appear advisable, therefore, to limit the size of this report so that it can be published with the funds provided, and any additional funds for printing might better be devoted to the publication of educational bulletins, as recommended in another part of this report.

The bureau of sanitary engineering and the division of food and drugs each have separately printed that part of the report relating to them. This would seem to be an unnecessary expense, although there may be circumstances which make it justifiable.

Bureau of Communicable Diseases.

Chapter 560 of the acts of 1910 of the State of Maryland, by adding sections 21a and 21g to article 43 of the code of public general laws, authorized the formation of a bureau of communicable diseases in the State department of health and authorized the department to appoint a chief and assistant chief of the bureau. In accordance therewith this bureau was organized in 1910. Its personnel and their respective salaries at the present time are as follows:

| | |
|---------------------------------|----------|
| Assistant and acting chief..... | \$1, 800 |
| One clerk..... | 600 |
| One clerk..... | 420 |
| One clerk..... | 300 |
| One stenographer..... | 600 |
| One inspector..... | 1, 000 |
| | <hr/> |
| | 4, 720 |

Duties of the bureau.—The duties of the bureau are defined by section 21b of the above-mentioned act as follows:

1. To secure accurate and complete returns of communicable diseases.
2. To examine into the prevalence and cause of such diseases and devise means for their control.
3. To examine into and investigate epidemics and nuisances and devise means for their control.
4. To publish monthly a bulletin for health officers.
5. To perform such other duties and exercise such other functions as the State board of health, or the secretary thereof, may designate.

NOTIFICATION OF DISEASES.

Requirements of law.—In conformity with existing laws, house holders are required to report immediately to the local board of health cases of smallpox, diphtheria, membranous croup, scarlet fever, typhoid fever, typhus fever, measles, mumps, whooping cough, or any other infectious or contagious disease dangerous to the public health. A penalty of not to exceed \$100 is provided for failure to report. (Sec. 50, art. 43.)

The law also requires physicians to report immediately to the board of health of the city, town, or county cases of smallpox, diphtheria, membranous croup, scarlet fever, typhoid fever, typhus fever, yellow fever, measles, whooping cough, or other contagious or infectious diseases dangerous to the public health. The penalty for not reporting is a fine of not less than \$50 nor more than \$200. (Sec. 51, art. 43.)

Local boards of health must keep records of all cases reported to them, by name, locality, disease, date, name of person reporting, and record of quarantine, isolation, disinfection, or other preventive measures, and must notify the school board. (Sec. 52, art. 43.)

Any board of health upon receiving notice of any case of smallpox or other contagious or infectious disease dangerous to the public health shall, within 24 hours, notify the State board of health. (Sec. 53, art. 43.)

Tuberculosis.—In addition to the foregoing a separate law requires special reports of cases of pulmonary and laryngeal tuberculosis to the State department of health.

The department must keep a register of all these cases, which shall be confidential. (Sec. 56, art. 43.)

The superintendent or other person in charge of institutions which are supported in whole or in part from public funds must report all cases of pulmonary and laryngeal tuberculosis in these institutions. A penalty of not more than \$25 is provided for noncompliance. (Sec. 57, art. 43.)

Physicians must also report, within seven days, to the State board, all cases under their professional care; a penalty of \$10 being specified for not doing so. (Sec. 58, art. 43.)

Occupational diseases.—An act passed by the legislature in January, 1912, adds section 5a to article 43 of the Code of Public General Laws of Maryland and requires that every physician attending or called to visit a patient whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, or mercury, or their compounds, or from anthrax, or from compressed-air illness, or any other ailment or disease contracted as the result of the nature of the patient's employment, shall send to the State board of health a written notice stating the name and full postal address, place of employment of the patient, and the nature of the occupation and the disease from which, in the opinion of the physician, the patient is suffering, with such other information as may be required by the State board of health. For failure to so report a fine not exceeding \$5 is provided. The law also requires the State board of health to submit such data as may be received to the bureau of statistics and information of the State of Maryland.

Ophthalmia neonatorum.—If at any time within two weeks after the birth of any infant one or both of its eyes or the eyelids become reddened, inflamed, or swollen, or discharge pus, the midwife, nurse, or person other than a legally qualified physician in charge of such infant shall refrain from the application of any remedy for the same, and shall immediately report such condition to the local health officer or to some legally qualified physician in the city, town, or county wherein the infant is cared for. Any person or persons violating the provisions of this section shall, on conviction, be punished by a fine not to exceed \$5. (Sec. 55k, art. 43.)

Puerperal sepsis.—Every person not a legally qualified physician, practicing as midwife or acting as attendant upon woman in childbed in the State, who shall find any lying-in woman to have fever, shall forthwith notify the local health officer, and shall refrain from attendance upon any other parturient woman, or woman in childbed, until the local health officer shall give written permission to resume such practice. (Sec. 55, art. 43.)

Collection and disposition of reports.—Regular printed forms are used for morbidity reports; one for smallpox, one for tuberculosis, one for occupational diseases, and one for all other reportable diseases. The card forms used in reporting tuberculosis and occupational diseases are transmitted direct to the State department of health. Reports of other diseases are sent direct to the respective local health officers. Tuberculosis and occupational diseases are the only ones which are reported to the State department of health from the city of Baltimore. Other diseases occurring in that city are reported to the Baltimore commissioner of health, but no report of them is sent by him to the State department.

Typhoid fever, etc.—The local health officer transcribes the information from the report cards received by him to a daily report, which is sent to the bureau of communicable diseases and there filed away by counties and months. At the end of each month the information on these daily reports is transcribed, grouping the different diseases according to counties and towns. At the same time a summary is made of the information received during the month. It is this transcription which forms the monthly bulletin for health officers and which will be commented upon later as forming a large amount of unnecessary work. The daily reports properly filed make a fairly good "ready reference" when special cases are to be looked up. It would be a better plan, however, to send the original report cards to the State department of health and file a transcript in the office of the local health officer.

In addition to this monthly bulletin, a monthly report is submitted to the State board of health and to the United States Public Health Service. Daily reports are sent to the health commissioner of Washington, D. C., and the health commissioner of Baltimore City, showing the number of typhoid fever cases reported in the counties immediately surrounding their respective jurisdictions. The reports include the names of patients, in order that the authorities may more readily keep a check on any cases that appear in dairies shipping milk to Washington or Baltimore.

While there is a penalty provided in the case of physicians and householders for failure to report cases of communicable diseases, there is no penalty that the State department of health can enforce against local health officers for failure to make their reports. A great weakness in the entire health organization is in the inadequate local organization and the inadequate control of the State over county or local boards of health. There are some counties from which reports are very unsatisfactory, and there is no way under the present law that would be effective in compelling the county health officer to send in these reports as desired. However, it should be said that, in the opinion of the United States Public Health Service at Washington, morbidity reports in Maryland are better than the average and are the equal of those in any State.

Checks are kept on the thoroughness with which diseases are reported, by a perusal of the daily papers published throughout the State, by information received from citizens or officials in various parts of the State, by a study of the death certificates, and the daily reports received from the laboratory containing the results of the examinations of cultures, sputum, etc.

When the presence of disease is detected in this way and has not been reported to the health authorities, an investigation is made and prosecutions begun if necessary.

Tuberculosis.—The law requires that cases of tuberculosis occurring in the State of Maryland, including the city of Baltimore, shall be reported direct to the State department of health and that such reports are to be considered confidential. For this reason only the deaths from tuberculosis are included in the monthly bulletin.

All cards are filed alphabetically, separating them according to counties, a separate file being kept for the city of Baltimore. The cases reported by physicians are entered on cards by name under the name of the physician reporting the case.

It frequently happens that several cards are received reporting the same patient, as, for instance, the physician, visiting nurse, and an institution may each have seen the case and sent in a report.

Occupational diseases.—The law may be adequate in so far as it requires physicians to report occupational diseases, but it is lacking in a very important detail, in that it does not give the State department of health power to compel employers to do what is necessary to lessen the danger to employees of contracting disease as the result of their occupation.

Statistics of morbidity.—Morbidity reports are currently received and used in the bureau of communicable diseases. When they have served their immediate purpose of giving a knowledge of the occurrence of disease and of furnishing information necessary for its control, they still may perform a useful function compiled as morbidity statistics to show the relative prevalence of disease by months, seasons, and years, and the age, sex, occupation, race, etc., of those affected. With the present organization of the Maryland department of health this detailed statistical compilation of morbidity reports might properly be done by the bureau of vital statistics, which has the necessary equipment for making such statistical compilations. Properly compiled, with tabular and diagrammatic presentation, these statistics would make readily available information of much value.

Morbidity reports are probably the most valuable data that come to a health department. They have both an immediate and a remote value. The immediate value is that which enables the health officer to learn promptly of the existence of disease, to take prompt suppressive measures, to study the progress of epidemics, and to keep track of cases on his spot maps and the like. The remote value relates to the statistics of diseases, i. e., compilation and tabulation with reference to locality, age, sex, color, etc.

While all statistical tables and reports would, as recommended, ultimately be worked up by the bureau of vital statistics, reports of diseases should come first to the bureau of communicable diseases, the bureau which is primarily concerned in the control of disease.

Diseases of interest to the public health officer might be grouped as follows:

1. Communicable diseases (infectious and contagious), such as tuberculosis, typhoid fever, measles, syphilis, and ophthalmia neonatorum.

2. Occupational diseases, such as caisson disease, phosphorus poisoning, and anthracosis.

3. Dietetic diseases, such as beriberi and possibly pellagra.

4. Mental diseases requiring State care, such as imbecility, idiocy, and insanity.

5. All other diseases.

It is unfortunate that State laws generally do not require the reporting of any but those diseases which come under the first and second classes, and only 15 States require the reporting of occupational diseases. It is true that a few States require the notification of pellagra, and in some States, including Maryland, it is reported voluntarily by physicians under that section of the law requiring the notification of "infectious," "contagious," or "communicable" diseases.

Much valuable data relative to morbidity is lost to the health authorities by failure to report, and while it might seem extreme to require physicians to submit morbidity reports of all cases of sickness under their charge they should report promptly cases of communicable diseases, and it at least would not be out of place or asking too much to require all hospitals or institutions within a State where provision is made for treating the sick to submit a monthly report of all cases of illness coming under their observation.

Communicable diseases developing in Maryland but receiving their infection in another State should be reported and the health officer of the State from which they came notified. This is one way that a State can cooperate with another, and no doubt the information received would be valuable to the health department of that State. There is, in fact, too little cooperation between the several States.

In studying laws relative to the reporting and control of disease, one is impressed with the use of the terms "infectious," "contagious," and "communicable." These words seem to be used without regard to their true meaning.

An infectious disease is one due to the introduction into the body of any living animal or vegetable organism, capable by its growth or multiplication of producing a change in the function or structure, or both, of one or more organs or tissues.

A communicable disease is a disease capable of being transmitted directly or indirectly from a person suffering from that disease to another person. It must, therefore, be caused by a living organism and is, therefore, an infectious disease.

The term "contagious" is one which has no place in modern health nomenclature; it indicates a disease that is transmitted by touching or by merely being in the vicinity of a patient. As more becomes known about the methods of transmission of disease, "contagious" diseases become fewer and fewer.

The laity can understand the term "communicable" and it implies as well, "infectious" and "contagious." It would seem, therefore, to be the proper word to use for this class of diseases.

As a matter of fact, as far as the wording of any law requiring the reporting of disease is concerned, it is perhaps better to adhere to the words "notifiable disease" or "any disease notifiable under the act," as a law might well include diseases which were possibly not communicable, as for instance, pellagra, which may, after all, be a disease due to diet.

THE CONTROL OF DISEASE.

The control of disease including its epidemiologic study is also a function of the bureau of communicable diseases.

General requirements of laws.—Whenever the State department of health has cause to believe that there is any cholera, smallpox, or other contagious or infectious disease invading the State, it is its duty to take such action and enforce such rules and regulations as may be necessary to prevent the introduction and spread of such disease. For violation of any rule or regulation so made, penalty of not to exceed \$500 is provided for each offense. (Sec. 21, art. 43.)

Whenever any local health officer receives reliable notice or otherwise has reason to believe that there is a case of cholera, smallpox, or other disease dangerous to the public health, he is required to investigate and to take all proper steps to suppress such disease. County commissioners are authorized to incur and pay all necessary and legitimate expenses therefor.

Health officers are required to promptly notify the secretary of the State board of health of the existence of any epidemic or "unusual sickness or mortality." It is the duty of the secretary of the State board to cooperate, and in such cases he may exercise all the powers of the State board of health. (Sec. 29, art. 43.)

On the certificate of a qualified practitioner, the health authority of any city or town, or justice of the peace for any county, may, when necessary, require the owner or occupant to cleanse or disinfect any house and the articles therein. For failure to comply, the owner or occupant is liable to a fine of not less than \$5 and not more than \$10 for every day during which he or she continues to make default.

The same officials also have authority in case of default as above to clean and disinfect and charge the expenses against the owner or occupant. If he is an indigent, the city, town, or county must pay expenses. (Sec. 30, art. 43.)

The same authorities may direct the disinfection or destruction of bedding, clothing, or other articles exposed to infection, and may compensate the owner for any loss. (Sec. 31, art. 43.)

Section 32 of article 43 gives the authorities power to remove, under certain conditions, patients suffering from communicable diseases to an isolation hospital, when such hospital is provided, at the cost of the city or county. The penalty provided for disobeying an order is a fine of not less than \$50 nor more than \$200, or imprisonment in jail for not less than one month nor more than six months.

Section 33 of article 43 provides a penalty not exceeding \$500, or imprisonment not exceeding 12 months, or both, for anyone who, while suffering from any dangerous infectious disorder, wilfully exposes himself or herself in any public place or conveyance, or who disposes of any article which has been exposed to infection without previous disinfection.

Section 34 of article 43 provides a penalty of not exceeding \$100 for carelessly carrying about children or others afflicted with infectious diseases, or knowingly introducing infectious diseases into another person's house, or permitting such children to attend school or other public places.

Section 35 of article 43 provides a penalty of not exceeding \$25 for failure on the part of a driver of a public conveyance to immediately have such conveyance disinfected after carrying any person suffering from a dangerous infectious disorder, or a corpse dead of such disorder, and provides further that he shall not be required to convey such person or corpse unless reimbursed a sufficient amount to cover the cost of disinfection.

Section 36 of article 43 provides a penalty not exceeding \$250 for knowingly letting for hire any house, room, or part of a house which has been occupied by any person suffering from any dangerous infectious disorder, without previous disinfection, and a penalty of not exceeding \$500 for the making of any false statement relative to the above.

Section 37 of article 43 relates to the retention of bodies of persons dead of infectious diseases or any dead body which is in such a state as to endanger health in rooms and permits the authorities to order their removal and burial at city, town, or county expense, if necessary. Any person obstructing any order for removal and burial is liable to a fine not exceeding \$200, or imprisonment not exceeding six months.

Section 38 of article 43 gives the authorities power to build, or contract for the building, of hospitals or other places for the care of the sick. Two or more local authorities are authorized to join in providing a common hospital.

Section 39 of article 43 permits the authorities to charge patients who are not paupers for such hospital treatment.

Section 54 of article 43 requires that where any doubt exists as to the diagnosis of any disease believed to be of an infectious or contagious character the matter shall be reported to the State department of health which shall make all necessary investigation, and the State bacteriologist is required to render to local authorities and practicing physicians all assistance necessary in making a diagnosis, and to the State vaccine agency in testing vaccine.

Section 50 of article 43 provides that upon the death, recovery, or removal of any person or persons suffering from smallpox, diphtheria, membranous croup, scarlet fever, typhoid fever, typhus fever, measles, mumps, whooping cough, or any other infectious or contagious disease dangerous to the public health, such of the rooms of said house and such articles therein as, in the opinion of the local board of health, have been subjected to infection or contagion, shall be disinfected by the said board of health, and a written statement of the fact of such disinfection shall be given to the householder.

Health regulations.—In accordance with the authority conferred upon it by law, the State board of health, has from time to time issued regulations relating to the control of communicable diseases. These regulations are to set forth in greater detail those precautions that are to be taken, in order to comply with existing law, and they will subsequently be referred to in discussing the subjects to which they relate. Mention may here be made, however, of one regulation specifying the time during which children suffering from certain diseases are to be excluded from school and what precautions are to be taken to prevent the spread of the infection to other children. Scarlet fever, measles, diphtheria, whooping cough, mumps, chickenpox, scabies or itch, ringworm, and typhoid fever are considered.

Tabulation of regulations relative to the control of communicable diseases.

| Disease. | Patient. | | Contacts. | | Certificate from doctor required before admission to school. | Disinfection. | Placarding. |
|---------------------|--|---|--|--|--|---|--|
| | Isolation. | Exclusion from school. | School attendance. | Isolation of bread-winners. | | | |
| Scarlet fever..... | 28 days from date of onset. | Same period as for isolation and until disinfection is completed. | Excluded for 28 days, or if removed from house, 8 days. | Not necessary if they do not come in contact with patient, bedding, etc. | Yes..... | House and clothing at termination of period of isolation. | According to regulations of local board of health. |
| Diphtheria..... | Until 7 days from disappearance of signs and symptoms if at that time culture is negative. | Same..... | If not living in infected house but exposed to infection, may attend after one negative culture is obtained. | ..... | Yes..... | According to regulations of local board of health. | Same. |
| Measles..... | 14 days from disappearance of rash. | Same..... | Excluded until patient is released. | ..... | Yes..... | At the termination of the period of isolation. | Same. |
| Whooping cough..... | As long as symptoms persist. | Same..... | Excluded if cough is observed unless certificate from physician states not whooping cough. | ..... | Yes..... | According to regulations of the local board of health. | Same. |
| Chickenpox..... | As long as scales or crusts remain. | Same..... | ..... | ..... | ..... | Of clothing..... | Same. |
| Mumps..... | Until 7 days after the disappearance of all symptoms. | Same..... | ..... | ..... | Yes..... | According to regulations of the local board of health. | Same. |
| Scabies..... | ..... | Until cured. | ..... | ..... | Yes..... | Of clothing..... | ..... |
| Ringworm..... | ..... | do..... | ..... | ..... | Yes..... | ..... | ..... |
| Typhoid fever..... | ..... | ..... | Not excluded, but may not bring to school any food or drink. | ..... | ..... | ..... | ..... |

Circulars of information.—Some very good circulars have also been published and distributed relating to the subjects of tuberculosis, diphtheria, measles, scarlet fever, whooping cough, and typhoid fever. These are all written in simple language and are intended to be sent to each householder where a case of the disease is present.

Investigations.—For the enforcement of the above-mentioned provisions of law, and those to be referred to subsequently under special headings, the department has authority to have its officers visit different sections of the State.

Certain inspections and investigations relative to the prevalence of diseases and nuisances are thus carried on from time to time during the year by the acting chief of the bureau, who is also frequently called upon to act as an expert in the diagnosis of communicable diseases, but much of his time is taken up with routine office work. One or more of the inspectors of the department are detailed from time to time with this bureau for special investigations relative to the prevalence of diseases, nuisances, or failure to report diseases.

There is no intention in the foregoing statements to underrate the work conducted in the central bureau. Much of this work is undoubtedly of distinct value to the State, but on account of lack of adequate field forces, the office is not able to discharge all the duties that should be expected of it.

Lack of field officers.—In order to control outbreaks of disease there is necessity of an adequate field force to take the required precautions when the local authorities are unable to do so. While the department of health is frequently asked by county or municipal health authorities for advice relative to the suppression of an outbreak of a communicable disease such as diphtheria, the actual work involved in its eradication is usually left to the local authorities, due to the absence of a properly organized field force. Owing to this the department is unable to take the active part that it should in such emergencies.

The laws relative to the control of disease place the matter largely in the hands of the local authorities, but nevertheless with a better field force the State could give necessary supervision which would no doubt be welcomed by the cities and counties.

Disinfection.—The enforcement of the law relating to disinfection is left to the local health officer. Except for tuberculosis, he does not have to report that the same has been done. After disinfecting for tuberculosis he reports by a check after the name on the mortality report sent to him every month, and he returns this report to the State department of health.

Terminal disinfection is practiced in all the communicable diseases, the favorite and recognized disinfectant for this purpose being

formaldehyde gas generated by some approved method. The department of health of Baltimore City uses the solid paraformaldehyde, with the addition of heat, as a disinfectant in all cases of communicable diseases, and control cultures are exposed in the rooms undergoing disinfection.

Tuberculosis.—As previously stated, cases of tuberculosis of the lungs or larynx are required by law to be reported. By the adoption of such a law Maryland showed her desire to be in the front rank in the control of the disease. In fact, Maryland was the first State to have such a law, and it has been in force since 1904.

In addition to requiring reports, this law contains a number of other provisions.

After vacation by death or removal, apartments occupied by consumptives are required to be disinfected. Disinfection is to be done by the local board of health. It is the duty of the householder, physician, or other person to notify the board of health of such death or removal within 48 hours. A penalty of \$10 is provided for non-compliance. (Sec. 59, art. 43.)

No apartment that has been occupied by a consumptive can be let or hired without the above disinfection, and a penalty of \$25 is provided. (Sec. 60, art. 43.)

Anyone who is suffering from pulmonary or laryngeal tuberculosis, pneumonia, or influenza is required not to dispose of his sputum so as to endanger others. For violation of this provision a penalty of \$10 is specified. (Sec. 61, art. 43.)

The physician attending any case of pulmonary or laryngeal tuberculosis is required to see that all the necessary precautions are taken to prevent the spread of the disease, and if no physician is in attendance this duty devolves upon the local board of health. (Sec. 62, art. 43.)

Section 63 of article 43 relates to the methods to be pursued in the prophylaxis, amount paid to the physician, etc. The details of administration are mentioned later.

For intentionally falsely reporting a case as tuberculosis there is imposed a fine of \$100, or imprisonment not exceeding six months, or both. (Sec. 64, art. 43.)

The State board is authorized to prepare and keep on hand necessary circulars, blanks, etc., and for the defraying of expenses in connection with the control of tuberculosis there is appropriated the sum of \$10,000 annually. (Sec. 65, art. 43.)

It is unlawful for any person to expectorate or spit on the floors, sides, seats, or platforms of any railway or railroad passenger car in the State under penalty of \$3 and costs, one-half of said fine to go to

the informer or party arresting and furnishing the evidence upon which the offender is convicted. This section further provides an exemption in the case of smoking cars where cuspidors are not furnished by the company. (Sec. 238, art. 27.)

A regulation of the State board of health makes it a duty of the patient, nurse, attendant, or householder to dispose of the sputum from a case of tuberculosis so that the health of others will not be endangered and to otherwise carry out the instructions given by the attending physician.

Upon receipt of a card reporting a case of tuberculosis, a blank form is sent to the attending physician requesting him to fill in the information required and to indicate whether he desires a prophylactic package to furnish to the patient, such packages being supplied by the bureau of communicable diseases free of charge. If he does, instructions are sent to one of the stations (of which there are 142 throughout the State), which keep these packages on hand, to issue one to the physician. If the physician can not assume charge of the prophylaxis, he so indicates on the blank form, and the responsibility then devolves upon the local board of health.

Any physician who is willing to see that the patient receives the prophylactic package and is willing to give the necessary instruction to the patient and contacts to prevent the spread of the disease is entitled to a fee of \$1.50 from the State department of health. A check for this amount is sent to the physician after the local health officer has certified in the blank mentioned above that the physician has taken all precautions required. The fee is paid in the case of laryngeal or pulmonary tuberculosis only, and in either case tubercle bacilli must be found in the sputum, showing the disease to be in the active stage.

As the reports of tuberculous persons are confidential, the names are not published, and it therefore becomes necessary for the local health officer to certify that the attending physician has performed his duty in connection with a case of tuberculosis without himself knowing the identity of the patient. Under such circumstances certification is unsatisfactory. The confidential clause could be properly observed without detriment either to the interests of the patient or the public if the county health unit were a part of the State department of health.

As is the case with the reporting of other diseases, much trouble is experienced in getting physicians to answer all the questions asked in the blank concerning tuberculosis.

Antituberculosis packages.—In 1908 the State department of health received a gold medal from the International Congress on Tubercu-

losis for the best prophylactic package. This package is now in use and contains the following:

| | Unit value. | Total value. |
|---|----------------|-----------------|
| 100 cup fillers..... | \$0.0035 | \$0.35 |
| 100 Japanese napkins..... | .00062 | .062 |
| One-half pint liquid disinfectant..... | .10 | .10 |
| 1 sputum cup..... | .07 | .07 |
| 2 waterproof bags..... | .04 | .08 |
| 1 book of information for persons having diseases of the lungs..... | | |
| Total value of package exclusive of book..... | | .662 |

This is a supply estimated to last a patient three months, and to secure additional supplies no further authorization is required.

As showing the extent of the enforcement of this law, the following is a statement of the prophylactic supplies issued to tuberculosis patients in 1912:

| | |
|--|---------|
| Supplies issued in crates (number of packages)..... | 1,525 |
| Supplies issued from the State board of health (number of packages)..... | 540 |
| Supplies issued in bulk (not in packages) to the International Visiting Nurses' Association, of Baltimore city, Phipps Dispensary, etc.: | |
| Napkins..... | 880,400 |
| Sputum-cup fillers..... | 435,800 |
| Disinfectant..... | 5,463 |
| Tincups..... | 2,040 |
| Pockets..... | 300 |
| Books of information..... | 560 |

In the city of Baltimore the packages are issued from the office of the State department of health. In the counties certain physicians, drug stores, etc., located in places most convenient to the largest numbers of people are designated to issue these packages, and the supplies are kept up by the State department.

While statistics show that the incidence of the disease is about the same as in previous years, it at least has not increased.

Smallpox vaccination.—The Maryland vaccination law was first enacted many years ago and was amended by an act of the assembly, approved April 5, 1900. It makes it the duty of a physician to vaccinate all children in the circle of his practice who may be presented to him within one year after birth if such child shall be in a proper condition for such service. A penalty of \$5 is provided for refusal to vaccinate. (Sec. 43, art. 43.)

It is obligatory on the parent or guardian to have his or her child vaccinated within 12 months after its birth, if it shall be in proper condition, or as soon thereafter as practicable. Also, any parent or guardian having any other person under his or her control or care not duly vaccinated, shall cause such person to be vaccinated prior to the 1st day of November. (Sec. 45, art. 43.)

The law prohibits children from attending public school unless they have been successfully vaccinated. (Sec. 46, art. 43.)

Further provisions of the law are that, if practicable, no vaccine shall be used more than four removes from the cow; that the vaccine shall be furnished free of charge to physicians and surgeons of the State; that the State vaccine agent may make use of a human virus not to be taken from the arm of a child less than three months old; that any physician who shall knowingly or willfully use any virus defective in its nature by having passed through a scrofulous system, or having been taken from one with any disease of the skin, chronic sore, or other disease, during the progress of the vaccine disease, or shall use any crust which during the progress of the vaccine disease was punctured or otherwise injured, shall be subject to a fine of not less than \$100 nor more than \$500 for each offense.

Physicians vaccinating indigent children are entitled to a fee of 50 cents from the county commissioners or city of Baltimore, except when vaccine physicians have been regularly appointed by the authorities.

All fines collected under the vaccination act go into the school fund.

The law has some good provisions as far as it goes, but is antiquated and needs revision. The law is adequate as far as the primary vaccination of children is concerned. In the case of adults, however, there is no provision compelling them to submit to vaccination, or of compelling anyone, except children who wish to attend school, to be successfully vaccinated, except possibly the general law which gives the board of health the power to take all proper steps for the restriction or suppression of "communicable diseases." (Secs. 3-8-14, art. 43.)

There should be some provision whereby every person in the State of Maryland would be compelled to submit to vaccination as many times as necessary to produce a successful vaccination, or until it was proved that they are not susceptible to the virus; and in the event of the appearance of smallpox, or the threatened appearance, as many times as may, in the opinion of the health officer, be necessary to produce immunity in persons who have not been successfully vaccinated within the preceding two years.

The problem of handling vaccine is under what is known as the State vaccine agency. This has been in existence for more than 30 years. At the time the law forming this agency was passed it was no doubt a satisfactory method, and it was contemplated at the time that the vaccine should be made by the State. The vaccine so made, however, did not prove satisfactory and at present it is being bought from reliable firms.

Vaccination is of the greatest importance to the State department of health which has to handle smallpox outbreaks, and, as it is now in a position to purchase and dispense vaccine so as to secure the best possible results, the enforcement of vaccination and the supplying of vaccine should be entirely under its charge.

The vaccine agent receives \$600 a year for his services. By transferring his duties to the State department of health his salary could be saved, and the supplying of vaccine thus accomplished at less expense to the State.

That the present method is not satisfactory is evidenced by the fact that many counties purchase their vaccine from commercial establishments in preference to depending on the vaccine agent.

The State department of health, although vitally interested in the subject, at present receives few or no reports relative to vaccination. The agency must keep a record of the names of the doctors to whom vaccine is issued and the amount, but no reports are required as to the use the vaccine has been put to by those to whom it has been issued or the results obtained. It is, of course, extremely important to have such information, and there should be a full report sent to the department of health by each vaccinator relative to the number of people vaccinated and the results.

Typhoid fever.—In addition to receiving reports of cases and making investigations of particular outbreaks, the bureau of communicable diseases does not exercise much direct control, the actual enforcement of measures devolving upon the local authorities.

The State department of health, however, issues two circulars on typhoid fever, one of which is intended to accompany a prophylactic package furnished by the city of Baltimore for distribution to families having the disease and living on the watershed from which the city water supply is obtained. This prophylactic package contains the following articles:

Expendable:

- Two 5-pint bottles 90 per cent carbolic acid.
- One bottle bichloride of mercury (200 tablets) (one to pint, 1-1,000 sol.), Green.

Nonexpendable:

- One bedpan.
- One urinal.
- Two 5-gallon iron or fiber buckets (with covers).
- One agate-ware measure.
- One enamel-ware basin.
- One large mosquito netting.
- Two bile-culture mailing outfits for feces and urine.
- Two copies General Order, No. 39.
- Three copies directions for the use of the standard prophylactic package for typhoid fever.

The above materials are sufficient for 28 days, or 4 weeks.

The State department of health also issues free of charge to any physician in the State requesting it a prophylactic package containing the following:

- Six $\frac{1}{2}$ -pint bottles of an approved disinfectant.
- Two hundred tablets of bichloride of mercury.
- Four bile-culture mailing outfits for feces and urine.

In this instance the family in which the typhoid fever has occurred furnishes the nonexpendable articles, as it would be a great expense to the State to issue these materials over such a large territory, knowing that many times they could not be recovered.

The State department of health also strongly advocates the use of antityphoid vaccine and furnishes it free of charge to physicians.

The extent to which this is done is shown by the fact that 1,917 complete immunizing doses were furnished during 1912.

For the convenience of physicians who wish to have biological investigations made, there are a number of so-called culture stations in different parts of the State where culture tubes, swabs, and mailing outfits may be obtained to transmit specimens for examination in the bureau of bacteriology. There are also three pamphlets of information which are sent to the practicing physicians throughout the State, one of which gives information concerning the laboratory service and outfits with special reference to the correct method for collecting and forwarding specimens to the laboratory; one is a circular of information relative to the use of antityphoid vaccine, and one gives directions for sterilizing stools and urine in cases of typhoid fever, paratyphoid fever, dysentery, and other infectious diseases. Copies of these circulars also accompany the prophylactic package.

As a means to the better control of typhoid fever, the State board of health has promulgated two regulations. The first prohibits the use of night soil as a fertilizer except when mixed with at least an equal volume of lime, earth, or other inert material and covered with at least 2 inches of earth. It also prohibits the sprinkling of growing vegetables with night soil and declares that vegetables so treated are diseased, unsound, and unwholesome, and subject to condemnation and destruction by an inspector of the department.

The second regulation requires householders, physicians, nurses, or attendants to disinfect the stools and urine of persons known or suspected to be sick of typhoid fever or convalescent from said disease, during the full period of sickness and convalescence.

The regulation relating to the disposal of night soil for fertilizer permits a practice which it is impossible to properly control and which is consequently dangerous. It should therefore be rescinded.

Hydrophobia.—In January, 1912, the legislature passed an act (ch. 204) authorizing the State board of health to either prepare or purchase antirabic virus, and to furnish treatment to indigent persons

who have been exposed to the infection of hydrophobia, either in the counties or in the city of Baltimore. As the act also authorizes the State board of health to contract with some Pasteur laboratory to furnish the treatment, this is the method pursued.

Treatments are furnished by the Pasteur Institute, College of Physicians and Surgeons, Baltimore, Md., at \$60 per treatment, with the understanding that if the number of patients should exceed the appropriation, all those in excess will be treated free of charge. Two thousand five hundred dollars annually is appropriated to carry on this work.

This is thought to be an economical arrangement, as it would cost the State probably more than \$2,500 to organize and maintain a Pasteur laboratory. A more economical and probably just as satisfactory arrangement would be to secure the antirabic virus from the United States Public Health Service.

Common drinking cups.—In January, 1912, the State legislature passed an act (ch. 156) prohibiting the use of the common drinking cup in all public places within the State and upon all railroad trains and boats carrying passengers within the State, and giving the State department of health full authority to establish necessary and reasonable rules and regulations. For failure to observe the provisions of this act, a fine of not exceeding \$25 for each offense is provided.

A regulation of the State board of health defines the term "common drinking cup" and "public places" and otherwise states what is prohibited under the above-mentioned law.

Discussion.—The most important functions of the bureau of communicable diseases should be to investigate, suppress, and prevent disease. For these purposes it should receive constantly information regarding the prevalence of diseases and this should be made a daily study. In keeping track of particular outbreaks, the spot maps are very valuable and should be made use of. A system whereby cases can be followed up is also advisable or even necessary for thorough work. This is not now done.

It is necessary that the biological laboratory and the bureau of communicable diseases cooperate, as the bureau not only frequently depends upon the laboratory for a diagnosis, but in many instances by receiving the results of laboratory examinations will learn of unreported cases of diseases.

Some physicians consider that they have reported a disease according to the law when they have submitted a specimen to the laboratory and obtained a positive report. The examination is made for the convenience of the physician, and does not relieve him of the obligation to report the disease in the correct way.

The duties of this bureau in combating disease should include investigations and operations in the field, publication of the laws and regu-

lations of the department and their distribution, careful supervision over local authorities, and the ability to send trained medical and sanitary inspectors into infected localities to assist local authorities and to enforce the laws and regulations of the department relative to reporting, isolating, quarantine, placarding, disinfection, etc.

At the present time communicable diseases are being handled by the majority of health organizations in an empirical way. This refers especially to quarantine and disinfection. As the causes and modes of transmission of communicable diseases are better understood, the uselessness and even absurdity of the old methods of quarantine and disinfection become more and more apparent.

It is the living patient who is dangerous, or to be more explicit, the discharges from the patient, while the dead body and fomites play but a small and unimportant part in the spread of disease. In typhoid fever, for instance, it is the feces and urine that disseminate the disease; in measles it is the catarrhal discharge from the eyes, throat, and nose; in diphtheria it is the discharge from the throat and nose; in scarlet fever it is probably the discharge from the throat, nose, ears, etc., and so on. It is true that the discharges may and do attach to utensils, towels, bedding, etc., but if disinfection of these soiled articles is practiced immediately, terminal disinfection is generally unnecessary.

Also in diseases like bubonic plague, typhus fever, yellow fever, and all diseases transmitted by insects, in the absence of blood-sucking insects the diseases can not spread, and terminal disinfection is useless. The periods of quarantine detention should also be modified and based on scientific observation, wherever possible, making use of laboratory methods to determine the presence of a causative organism after recovery.

The bureau of communicable diseases should take up investigations into the prevalence of such diseases as hookworm, trachoma, and malaria, and into the extent and causes of infantile morbidity and mortality, in addition to those communicable diseases which are ordinarily considered, and energetic methods should be instituted for their control.

Typhoid fever is of special importance, and in order to encourage uniformity of action and development of local health organizations the State should conduct a definite and lasting campaign against this disease, which affects all localities and the control of which involves many factors.

Maryland has taken little or no action toward studying trachoma within the State.

A certain amount of investigation indicates a probability that hookworm is almost a negligible quantity.

ABATEMENT OF NUISANCES.

Requirements of law.—In addition to the laws already mentioned, which give authority to the State board of health and the bureau of communicable diseases to investigate and take the necessary action to abate nuisances, the following laws prescribe the legal procedure to be followed:

Any two legally qualified practitioners or three or more persons affected may certify to the State board of health that a watercourse, well, spring, open ditch, gutter, cesspool, drain, privy pit, pigpen, or other place, or accumulation or deposit of offensive or noxious matter, or any house, building, or trades establishment, or manufacturing place is in a state of nuisance dangerous to health, in which case the board of health must investigate, and if found to injuriously affect an adjacent property or district, or to endanger health or life, it shall serve notice in writing on the proper person or persons to abate the nuisance within a certain time. (Sec. 74, art. 43.)

If the person maintaining the nuisance fails to abate it, or if the nuisance though abated is likely to recur, the board of health must apply to the Circuit Court for an injunction, which, if granted and not obeyed, subjects the offender to a penalty not exceeding \$10 per day during his or her default, and if willfully disobeying an order of the court to comply with the order of the State board a penalty of not exceeding \$20 a day. (Sees. 75 and 77, art. 43.)

Whenever the nuisance is created or maintained by more than one person, firm or corporation, the judge may direct by whom it shall be abated and in what proportion the costs shall be paid. (Sec. 76, art. 43.)

County health officer.—The county health officer has the power, after issuing an order in the proper way, to take persons violating that order before the local court, and there is a fine provided for failure to abate the nuisance of not less than \$1 nor more than \$10 for the first offense and not exceeding \$25 for the second offense. (Sec. 26, art. 43.)

Local boards of health are also required to take cognizance of all nuisances within the limits of their jurisdiction, and anyone refusing to comply with the requirements of the board shall be liable to a fine of not exceeding \$50. (Sec. 27, art. 43.)

The method of abating nuisances under the present law is very cumbersome, time-consuming, and inadequate so far as the State department is concerned, for it is required, after issuing a proper order to abate a nuisance, in the event of the order not being obeyed, to apply to the circuit court for an injunction. This means time lost and an unnecessary amount of labor and only remote possibilities of success.

The county health officer, on the other hand, is in a position to secure quicker results in the abatement of nuisances, for after issuing the necessary order to abate he may in the event of noncompliance bring prosecution before the justice of the peace or a local court, and no injunction proceedings are necessary. With the present organization in the counties, however, comparatively little is done toward the abatement of nuisances, and prosecutions by these officials are rare.

The State department of health conducts a great deal of correspondence relative to nuisances and gives advice in respect to their abatement, but few prosecutions are undertaken.

A nuisance from the standpoint of public health might be defined as any condition which by reason of its location or its mere existence may or does affect injuriously the life or health, directly or indirectly, of people living in the locality.

To abate nuisances a definite procedure should be practiced, consisting of:

1. An investigation and report.
2. A written order to abate, stating explicitly the nature of the trouble and what shall be done to correct it in a given time.
3. In case of noncompliance with the order to abate, two recourses should be open: (a) To prosecute before a local magistrate, or (b) where no structural changes are necessary, to perform the necessary work and charge expenses against the property.

Orders to abate nuisances should be divided into structural and nonstructural, all of the former to be handled by the bureau of sanitary engineering, the latter by the bureau of communicable diseases.

Nonstructural orders are those which in order to correct a nuisance require a cleaning up only, which may or may not necessitate the employment of laborers and horses and wagons, such as removing collections of refuse, cleaning up stables, prohibiting the use of night soil, etc.

Structural orders are those which in order to correct a nuisance require the alteration and repairs to some previously existing structure or some new construction, such as installation of plumbing, cutting windows for light and ventilation, building drainage ditches, filtration plants, placing concrete floors, construction of sewers, etc.

In a general way all nuisances requiring structural changes and all nuisances in connection with the water supply, private or public, or in connection with the disposal of sewage or refuse, should be in the hands of the bureau of sanitary engineering.

If nuisances are reported to the State board of health, they should be referred to the county health officer for investigation and action. If, in his opinion, the abatement of the nuisance involves structural

changes, he should refer the matter to, or ask the cooperation of the district engineer. It should be the duty of the county health officer or district engineer to handle all nuisances and not to refer them to the State department of health, except where advice is necessary on a certain point, or where assistance is required in matters of great importance. All nuisances investigated and orders issued, etc., should be reported to the secretary of the State board of health in a monthly report of transactions.

DISSEMINATION OF SANITARY INFORMATION.

At the present time the bureau of communicable diseases issues once a month to county health officers a bulletin consisting of a summary of the numbers of cases and character of the communicable diseases reported during the month, as compared with the previous month, and a detailed list of cases of each of the communicable diseases reported throughout the State (except in the city of Baltimore), giving the name, color, and age of the patient, duration of illness, town and county. In the case of tuberculosis the mortality list only is published, as the law requires that the morbidity reports shall be confidential.

The bulletin represents much labor in its preparation, and the results accruing from its publication must be very small indeed, as it is questionable whether more than the summary is ever read, and even though read with great care, very little of it besides the summary can be of much value to a local health officer.

It is, of course, necessary for one county health officer to know the status of communicable diseases in another county, especially in the adjoining counties, but the number of cases by disease, town, and county, is sufficient without going into details relating to the name, age, color, etc., of each patient.

The bulletin is based on information received from the local health officers. It is not printed, but is multigraphed. By greatly reducing its size, as much good would be accomplished, and time, labor, paper, and postage saved.

Except for those circulars on certain of the common communicable diseases, which have been previously mentioned, the Department of Health of Maryland does not publish any popular bulletin. A popular bulletin is deemed invaluable to instruct the people, provided it is issued so as to reach those most in need of instruction. It not infrequently happens that popular bulletins are read by persons who are in the least need of instruction and are apt to become a medium of advertisement for the health organization to show other similar organizations what is being done (on paper) for the people under its jurisdiction. This may advertise the health department, but it does

not materially help or enlighten those people for whom it should be intended.

It is, in fact, difficult to reach the citizen most in need of instruction, and it is perhaps useless to attempt even to teach by bulletin the mass of the adult population. If they do not already know, they will not be inclined to take heed. There is a method, however, which, if followed, might result in great benefit. The mind of the school child is a storehouse capable of receiving large consignments of information, and this information will eventually be carried to the home and imparted to the parents. In other words, to teach the future generation is hopeful. Popular bulletins, therefore, should be mainly distributed among school children, to be taken home by them to their parents, and what is very important, the sympathies and cooperation of school teachers should be enlisted that they may explain the meaning of the bulletin. In this way it might reach both the child and the adult. It is understood that this method is being pursued in the State of Michigan. Such bulletins could with great benefit take the place of the average textbook on hygiene and physiology, as now used in the public schools.

Bulletins on the subject of public health should ordinarily have at least one illustration, which frequently impresses the reader more forcibly than the text.

To reach the adult as well as the child, popular lectures should be delivered, combined with lantern slides and moving pictures.

A public health exhibit is given every year in different parts of the State by the Medical and Chirurgical Faculty of Maryland. This exhibit consists of charts and diagrams on milk and infant mortality, the effects and consumption of alcohol, social diseases, and tuberculosis, and during the exhibit a series of popular lectures is given, and booklets on different subjects of health are distributed. There should be, and will be, other units added from time to time, taking up soil pollution, water supply, typhoid, hookworm, malaria, insect carriers of disease, dietetics, etc. The exhibit consisting mainly of charts is carried by train to the more important towns and exhibited in some public building.

It might perhaps reach more communities if it were given in a railroad car prepared for the purpose, as has been done in California and other places. It is as important to reach the small rural communities as it is the larger towns.

The State of Maryland was the first to hold a tuberculosis exhibit (1904) and the State Board of Health of Maryland was the first State board to hold a child hygiene exhibition in conjunction with the National Association for the Study and Prevention of Infant Mortality (1909), as well as the first State board to hold a milk exhibition (1906).

INSPECTION OF FACTORIES, CANNERIES, DAIRIES, PUBLIC BUILDINGS, RESTAURANTS, ETC., AND CONVEYANCES OF COMMON CARRIERS.

Except for the collection and examination of food samples, which are covered by the food and drugs act, there is little law requiring sanitary control of factories, dairies, etc., and what there is depends mainly for its enforcement upon organizations not connected with the department of health. These subjects are mentioned here, however, because of their intimate bearing on the public health and because some of them can be handled by the department when a nuisance is involved under sections 2, 26, 27, 71, 72, 73, 74, 75, 76, and 77, of article 43, and section 429, of article 27, of the Public General Laws of Maryland. These laws have already been mentioned.

The department of health in connection with the collection of samples of foods and drugs does make some sanitary inspections, and through correspondence advises in respect to the sanitation of such places.

In the sanitary control of such places there are usually four distinct problems to be considered, namely:

1. The maintenance of sanitation and cleanliness, and
2. The correction of conditions causing occupational diseases, which should devolve on the bureau of communicable diseases;
3. The disposal of wastes, the regulation of which is a duty of the sanitary engineer; and
4. The collection and examination of samples of products, which would come under the division of foods and drugs.

It is of course not expected that each bureau would send an inspector in order to determine those points in which it is interested. One trained inspector representing the department, with a blank form covering all points, should be able to attend to the matter, noting the conditions on the blanks, collecting samples, and enforcing regulations of the department.

With a properly organized county health unit, it should be the duty of the county health officials to make frequent observation of conditions, so that the department need only make occasional inspections.

There is need of a law giving the department of health the power to maintain cleanliness and to compel the proper disposal of waste products and sewage in all factories, canneries, dairies, bakeries, stables, markets, slaughterhouses, public places, etc., and to require that the necessary things be done to prevent occupational diseases. This could no doubt be accomplished by an amendment to the act requiring the reporting of occupational diseases.

Requirements of law.—There are several provisions in law for the sanitation of workshops and factories, but their enforcement devolves

on the bureau of statistics and information, which is not a part of the department of health.

Section 243, article 27, provides that all factories, manufacturing establishments or workshops shall be kept in a cleanly condition and free from effluvia arising from any drain, privy, or other nuisance; they may not be so overcrowded as to be injurious to the health of the persons employed; they must be kept well lighted and ventilated in such a manner as to render harmless as far as practicable all gases, vapors, dust, or other impurities which may be injurious to health. Section 244, article 27, provides a fine of \$150 for each offense.

Section 245, article 27, prohibits the manufacture of clothing or any other article liable to transmit infection in any place or under any circumstances involving danger to the public health. A fine is provided of not less than \$10 nor more than \$100 for each garment so manufactured, made up, or worked upon.

Section 246, article 27, provides a penalty of imprisonment of not less than 60 days nor more than one year and a fine not exceeding \$1,000 for anyone who willfully permits clothes to be made as above.

A place is deemed to be dangerous to the public health, as contemplated in the previous paragraph, if each person working therein has less than 400 cubic feet of space; if the thermometer shall habitually stand during the hours of labor at or above 80° F. before the 1st day of May or after the 1st day of October; if any person therein is suffering from any contagious, infectious, or otherwise dangerous malady; or if there is less superficial area than 500 square feet; or if any artificial light shall be habitually used between the hours of 8 a. m. and 4 p. m.; or if the débris of manufacture or other dirt shall not be removed at least every 24 hours. (Sec. 247, art. 27.)

Section 248 of article 27 provides that the society or other body furnishing information will be entitled to one-half of the fine if the person is convicted.

Section 249 of article 27 provides that no room or apartment in any dwelling house or tenement house shall be used to manufacture certain articles, except by the immediate members of the family, until a permit has been obtained. Before issuing such permit the place must be properly inspected.

Sections 250-252 of article 27 give authority to the inspectors of the bureau of industrial statistics to enter any room in any tenement, dwelling house, workshop, etc., for the purpose of inspection, and provides for the employment of deputies and imposition of fines for refusal to give information, etc.

Section 239 of article 27 provides that all proprietors or owners of retail, jobbing, or wholesale dry goods stores, notion, millinery, or other business where any female sales people or female help are

employed for the purpose of serving the public shall provide a chair or stool for each of such female help. For not providing such chairs a fine of not less than \$10 nor more than \$100 is specified for the first offense, and for further offenses fines at the rate of \$1 a day for every chair or stool not furnished to said employees.

DAIRIES AND THE CONTROL OF THE MILK SUPPLY.

The question of the sanitation of dairies and the furnishing of a pure milk in the State of Maryland, a subject of the greatest importance to the health of its people, has been placed in the hands of what is known as the State live stock sanitary board, an organization which seems to be more or less inert as affects the adequate control of milk supplies. To place a matter of such importance to the health of the community under the control of such a body is incongruous to say the least, for there is only one logical organization to govern such a matter, the body concerned in the preservation of human life; in this case, the State department of health. Because of the great part it plays in infant mortality, because it is the most important food, because of the ease with which it is contaminated and its importance in the transmission of certain common and dangerous communicable diseases, milk, of all single items, is probably the most important to the health officer.

It is granted that the live-stock sanitary board should be the body to determine the health of the animal from which the milk is obtained, but after the exercise of such function its jurisdiction over milk supplies should cease, and all supervisory powers relative to the collection, preservation, and handling of milk in the State should be vested in the State department of health.

Baltimore City has the usual and customary force to supervise the milk supply for its people, as has every other city of any importance; but a city can only adequately handle the proposition within its corporate limits. As most dairies supplying the large cities are situated without these corporate limits, the city can do little in enforcing sanitary maintenance except to prohibit milk from uncleanly dairies from entering the city or destroying or denaturing it if it shall have entered. On the other hand, a department of health with a State-wide power and an adequate force is in the best position possible to control dairies located outside the limits of a municipality.

Requirements of law.—All persons supplying milk to cities, towns, or villages are required to register their herds of cattle with the live-stock sanitary board. A penalty of not less than \$1 or more than \$20 for each offense is provided. (Sec. 20, art. 58.)

The premises where cows are kept and where the business of dairying is being carried on are required to be inspected at least once

annually without notice to the owner, and if found in an unsanitary condition, shipping of milk is prohibited. (Sec. 21, art. 58.)

In accordance with this paragraph rules have been issued governing the sanitation of dairies, of which the following is a summary:

1. Buildings shall be well lighted and ventilated; shall be provided with sufficient feed troughs, suitable floor for carrying off drainage; sewer connections where possible and necessary.
 2. No water-closet, privy, etc., inhabited room, or workshop shall be located within any building or shed used for stabling of cows for dairy purposes or for the storage of milk or cream, and no fowl, hog, sheep, or goat shall be kept therein.
 3. Such premises must be kept in clean and good repair and well painted or white-washed at all times.
 4. All manure must be removed, so as to prevent its accumulation in great quantities.
 5. A sufficient number of receptacles made of nonabsorbent material must be kept for reception, storage, and delivery of milk. They shall be cleaned and purified, and all milk shall be removed without delay from rooms in which cows are kept.
 6. Cows shall be cleaned every day and be properly fed and watered with an abundance of pure, clean water.
 7. All inclosures in which cows are kept shall be graded and drained, so as to keep the surface reasonably dry.
 8. No garbage, fecal matter, etc., shall be allowed to remain in such inclosure unless sufficient straw or good absorbent materials be used to keep the inclosure clean at all times. No open drain shall be allowed to run through it.
- Any person disobeying these rules shall, upon conviction, be fined not less than \$10 nor more than \$20 for each day during which shipments shall be made after the necessary order has been given. The live stock sanitary board, at the request of the owner, is required to furnish him with a certificate of health if the rules have been complied with and no disease is present in the herd. These certificates may be revoked at the discretion of the board.

SCHOOL INSPECTIONS.

It is hardly necessary to enter into a discussion of the value of school inspection, for it is admitted by all, and in the cities of any moment such inspections are usually carried on in a more or less efficient manner. The rural schools, however, are sadly neglected in this respect. With an all-time health officer for each county or district, it should be one of his duties to inspect from time to time the rural schools and the school children within his jurisdiction and report his findings to the State department of health. It should be one of the duties of the county authorities also to take the necessary steps to correct insanitary conditions and to furnish any medical aid necessary to indigent school children. Proper blank forms should be devised for reporting all necessary data in a uniform way, and regulations to govern the inspections should be promulgated. Complete reports of inspections made in cities should also be transmitted to the State department of health for statistical purposes.

Field Forces, Active and Potential.

It will be understood from what has been previously said that the State department of health, while proficient in so far as its central organization is concerned, is greatly lacking in the necessary machinery in the field for making investigations and enforcing necessary measures for improvement of insanitary conditions.

FIELD INSPECTORS.

In addition to the officers and employees at executive headquarters, the State department of health has only five sanitary inspectors and no medical inspectors, the duties of these latter devolving upon the secretary of the State board of health and the chiefs of the bureaus.

One of the inspectors is detailed with the bureau of communicable diseases to carry on epidemiologic studies, and the other four are detailed for food and drug inspection work under the State food and drug commissioner. One of these latter is especially concerned with inspections of meat and slaughterhouses.

At the request of a chief of a bureau one or more of these inspectors may be detailed as occasion requires, but most of their time is devoted to their regular work. The salaries of these inspectors are as follows:

| | |
|---|----------|
| One sanitary inspector, at \$1,000..... | \$1, 000 |
| Four sanitary inspectors, at \$900..... | 3, 600 |
| Total..... | 4, 600 |

In addition to his salary, one of the inspectors receives 50 cents a day for his dinner during the time he is actually in the field.

The present field activities of the bureau of communicable diseases, especially, should be increased and additional ones assumed, but the present force is manifestly inadequate. This force should be enlarged and in order to increase the efficiency all of its members, except perhaps the inspectors employed by the bureau of sanitary engineering, should be under the general control of the chief of the bureau of communicable diseases, who would be responsible for their instruction, conduct, and discipline.

Furthermore, in order to be available to the entire department, and in every section of the State, this force should be a mobile one, and each inspector should be versed in the operations of the several bureaus. By this means he would be able to represent any one of the bureaus and could intelligently perform the several duties required of him. When a man from the time of receiving his appointment is detailed permanently to any one bureau, his value to the department as a whole is small, as there are few departments of health that are so well endowed that they can employ specialists in every line of work.

The field force should be employed for an indefinite period and not subject to discharge for political reasons, but only when found inefficient, insubordinate, or dishonest. Nothing is more conducive to inefficiency than frequent changes for political reasons.

Medical inspectors are also badly needed in the State department of health to travel through the State and inspect the work of the county health officers, not that there would be found much work to inspect, for the county health officer, generally speaking, does comparatively little, but with a view to determining the needs of the county and to getting the local officer to accomplish more.

COUNTY HEALTH AUTHORITIES.

In addition to the State department and its employees, the statutes provide for county boards of health and county health officers.

County boards of health.—The county board of health consists by statute of the county commissioners and meets semiannually in the months of May and October and as much oftener as may be deemed necessary.

Duties of the county board of health.—The duties of county boards of health, as stated in the statutes, are as follows:

1. To act in conjunction with the State board of health.
2. To report to the State board such facts in reference to the sanitary condition of their respective counties as they may deem important or necessary.
3. To adopt and enforce in full all rules and regulations concerning nuisances and cases of sickness.
4. To regulate all fees and charges in connection with their own regulations.
5. To establish the salaries of their respective county health officers on a maximum basis, as given later.
6. To investigate nuisances reported in writing by a qualified medical practitioner or any two or more persons affected thereby, and to serve the necessary written notice to abate, and to prosecute before a local magistrate any one refusing to obey such written notice.
7. To take cognizance of all unhealthy nuisances within the limits of its sanitary jurisdiction.

County health officers.—The county board of health appoints biennially a county health officer, who is required to be a well-educated physician and who, by virtue of his appointment, becomes secretary and executive officer of the board. He holds office for two years, but may be removed by the State board of health for cause upon charges made and considered at a regular meeting of the State board. This provision does not apply to Baltimore County.

Salary of county health officers.—Counties having a population of 15,000 or less are authorized to pay a salary to the health officer of not exceeding \$150 per annum, with an additional allowance of not more than \$50 per annum for each 5,000 population in excess of 15,000.

Duties of county health officers.—The duties of the county health officers, as provided by law, may be summarized as follows:

1. To act as secretary and executive officer of the county board of health.
2. To transmit to the secretary of the State board full name and post-office address.
3. To keep a record of the proceedings of the county board and of his own official acts.
4. To furnish a copy thereof annually to the secretary of the State board, with such other information in regard to the sanitary condition of his county as he may deem interesting or valuable for publication.
5. To enforce sections 30 and 31 of article 43, relative to disinfection of infected houses or articles.
6. To act as county registrar of vital statistics.
7. To take immediate steps to suppress dangerous communicable diseases within his county and promptly notify the secretary of the State board of health of the existence of such disease.

A number of county seats have been visited and the health officers interviewed. It can be very definitely stated that the county health officers generally are men of high class, of excellent standing in the community, and with large private practices. In fact, they are so busy with their practices that they usually have but little time to devote to their duties as public health officials. If these men were devoting as much time and energy to public health work as they are to private practice, they would no doubt be efficient health officers, but it would be impracticable to pay them sufficient salaries to induce them to give up their personal business and devote their entire time to the interests of public health. Under present conditions their official salaries are meager, and they do not even receive traveling expenses. Most of them have no assistants at all.

Except for the record of births and deaths and a file of the reports of communicable diseases, their records are very meager. The office is usually the physician's own private office. An exception to this is Baltimore County, which furnishes the county health officer an office in the courthouse at Towson, the county seat, and employs a clerk. The health officer does not live in Towson, however, and only comes to his official office once a week. In this county there are also 13 subdistricts, each with an assistant health officer. It should be said that Baltimore County partly surrounds Baltimore city and is more populous than any other county of the State. Notwithstanding its size and importance, it has not one incorporated town within its boundaries.

While the law gives the power to the State board to remove a county health officer for cause, practically this power can not be exercised. Even though the State board of health should decide upon the removal of a county health officer, the county commissioners would, after all, be judge and jury and may continue to employ him. If they should dismiss him, there is no law which would prevent

his reinstatement if they so desired. It would, in fact, have to be a very serious charge, amounting to a criminal offense, before the commissioners would be made to dismiss a county health officer at the instigation of the State board of health, unless they happened to be entirely in accord with that board.

With the exception of the cities of Baltimore and Cumberland, there is little or no real municipal health organization, although in some cities and towns there are health officers and a sanitary code which is utilized to advantage when the health officer is sufficiently energetic and receives the proper support from the city authorities. In some instances the county health officer is also the local health officer for the county seat.

Counties spend varying amounts during the year for health work—from a few hundred dollars to a thousand or more, these amounts covering the expenses of salary to health officer, vital statistics, disinfection, and vaccination.

RELATION OF STATE AND LOCAL HEALTH AGENCIES.

Probably the most important unit of a State health organization is its field force, including the medical and sanitary inspectors, visiting nurses, and the county and local health officers and employes.

On these agencies dependence must be placed for the suppression of epidemics; the inspection of factories, dairies, etc.; the collection of samples of water, food, and drugs for analysis; vaccination; investigations of nuisances, and the performance of many other duties. Without a field force little can be accomplished outside of the office, and that little devolves on the heads of bureaus, whose time is already so taken up with important office duties that much of the field work must be left undone. This means too often that the results had are mainly on paper.

To expect a health department to operate successfully without an adequate field force is as absurd and futile as to expect a police department to keep law and order without its patrolmen or to expect the chief of the fire department to successfully combat fires occurring in his district without firemen.

To coordinate and unify health work all the agencies performing it should be capable of wise supervision and control. And while our form of government predicates high authority in local administration it is necessary in the interest of the public health that the several units should be closely bound together under the supervision and control of a single head, the State department of health. Communicable diseases do not recognize county boundaries, and in the last analysis county and municipal health agencies are only a part of the State health organization.

Under present conditions, however, the county health agencies are generally inefficient. In consequence, what might be an invaluable field force is lost to the State and is of very little utility locally. This inefficiency is due largely to the fact that county health officers are appointed by the county commissioners and are subordinate to them. Furthermore, the salaries paid are so inadequate as to preclude the possibility of the health officer devoting a reasonable time to his duties.

Even though he may be public-spirited enough to work for little pay, the health officer's views can be dominated by the commissioners, who not infrequently know little about public-health matters. Moreover, men who are depending upon the votes of a circumscribed community for their election, or more especially their reelection, to a high local position, are loath to enact or support ordinances which will offend their constituents and thereby lose them votes. Unfortunately, laws or ordinances enacted for the purpose of preserving the public health do not always please the public, partly because of ignorance and partly because such laws or ordinances sooner or later touch the pocketbooks of a majority of the community.

Disease creeps upon a community so insidiously, attacking a person here and there before it becomes alarming, that the average lay mind does not realize there is any danger until the danger is acute.

Because of ignorance, the fear of offending their constituents, and a general disregard for the life and health of a community, local authorities are not inclined to pass adequate ordinances, and are not inclined to enforce them even when enacted, and any assistance they may render the health officer is too often but half-hearted, and only given when public opinion is aroused in his favor.

It is made clear by observation and study that the State department of health should be provided with an adequate field force. This could be accomplished by providing efficient district or county health units under its supervision and control. In each of these units there should be a capable physician, skilled in sanitary science. A man other than a doctor of public health, though skilled in sanitary science, would not fully answer the purpose.

A distinction must be made between the doctor of public health, the sanitary engineer, and the sanitarian. The latter has a knowledge of sanitary science, but is without a knowledge of disease, and has not all the qualifications of a sanitary engineer. Sanitary engineers are concerned with engineering problems of more or less magnitude, which when worked out produce conditions unfavorable to the existence of disease. Most of their success has been with water-borne diseases, like typhoid fever, where large engineering problems are frequently involved.

The doctor of public health, on the other hand, has not only an intimate knowledge of the manifestations of disease, but he has also a knowledge of sanitary science. He has not as great an engineering knowledge as the sanitary engineer, but has nevertheless quite enough to enable him to state in the case of water-borne diseases, for instance, that certain things must be done and, in a general way, how they can be done. For engineering details he can depend on the sanitary engineer.

There are many communicable diseases which are of the greatest importance from the standpoint of public health, and in which an early and accurate diagnosis is necessary, and where quick methods must be instituted to combat them. Among such diseases may be mentioned scarlet fever, diphtheria, smallpox, measles, bubonic plague, and typhus fever. The sanitary engineer or sanitarian who was not also a physician could not be expected to differentiate between varioloid and varicella, nor could he recognize a case of plague in man or animal by its symptoms or post-mortem findings. A doctor of public health is called upon as an expert in the diagnosis of these conditions.

In other words, in fighting disease the sanitary engineer must work hand in hand with a doctor of public health, and the doctor of public health only needs the advice of a sanitary engineer in certain well-defined conditions.

| County. | Salary of health officer. | Salary of others employed by county boards of health. | Office expenses. | Traveling expenses. | Disinfection. | Quarantine. | Vaccination. | Abatement of nuisances. | Vital statistics. | Remarks. | Total. |
|-------------------|---------------------------|---|------------------|---------------------|---------------|-------------|--------------|-------------------------|-------------------|---|------------|
| Anne Arundel..... | \$400.00 | \$600.00 | None. | None. | \$100.00 | None. | \$800.00 | None. | \$1,045.70 | Additional expenses: Antitoxin..... \$280.18 Care of patients in hospital..... 2,492.00 Other expenses..... 2,341.26 5,113.44 | \$2,945.70 |
| Baltimore..... | 1,000.00 | 3,875.00 | \$118.25 | None. | 1,064.53 | None. | 183.77 | \$232.96 | 1,765.84 | | 13,353.79 |
| Calvert..... | 100.00 | None. | None. | None. | 50.00 | None. | 150.00 | None. | 239.37 | | 539.37 |
| Caroline..... | 150.00 | None. | None. | None. | 75.00 | None. | None. | None. | 427.10 | | 652.10 |
| Carroll..... | 150.00 | 650.00 | None. | \$5.00 | 47.98 | None. | 146.50 | 2.50 | 676.98 | | 1,678.96 |
| Charles..... | 100.00 | None. | 10.00 | 35.00 | 35.00 | \$49.00 | None. | None. | 506.59 | | 726.59 |
| Dorchester..... | 250.00 | None. | None. | None. | 126.66 | None. | None. | None. | 736.36 | | 1,113.02 |
| Harford..... | 240.00 | None. | None. | None. | 35.00 | None. | None. | None. | 468.39 | | 743.39 |
| Howard..... | 300.00 | 500.00 | None. | None. | 25.00 | None. | None. | None. | 353.89 | | 1,178.89 |
| Kent..... | 150.00 | None. | 12.87 | None. | 114.17 | None. | 89.02 | None. | 388.36 | | 754.42 |
| Queen Annes..... | 150.00 | None. | None. | None. | (7) | None. | 140.00 | None. | 389.55 | \$5 allowed for each disinfection. | 679.55 |
| Washington..... | 1,025.00 | 326.00 | 1,120.04 | None. | 287.00 | 124.65 | 654.30 | None. | 1,147.43 | County health officer is also health officer of Hagerstown. | 4,684.47 |
| Wicomico..... | 150.00 | None. | None. | None. | 63.45 | None. | 21.50 | None. | 453.44 | | 688.39 |
| Total..... | 4,165.00 | 5,951.00 | 1,261.16 | 40.00 | 2,023.79 | 164.65 | 2,185.09 | 235.46 | 8,599.05 | | 29,738.64 |

These figures are taken from special reports submitted by the county health officers. Figures for the other counties are not given, because the county health officers of these counties did not answer the questionnaire sent to them by the secretary of the State board—a good example of the lax methods in the county and lack of control of State over county health officers.

Bureau of Vital Statistics.

The duties of a bureau of vital statistics had been performed under the authority of certain sections of article 43 of the Code of General Laws of Maryland of 1904, but it was found that to secure better results a more modern law was badly needed. Accordingly in 1910 a law was enacted adding, together with other sections, section 21a, authorizing the formation of a bureau of vital statistics; section 21f, defining its duties; and section 21g, authorizing the appointment of a chief and assistant chief. This was followed in 1912 by the passage of a law based on the model law proposed by the Bureau of the Census of the United States Government and other bodies, which places the matter on a firm basis. This law not only incorporates what was in the old law, but amends it, making it possible to organize so that complete returns may be secured.

The bureau of vital statistics was therefore organized in 1910. Its personnel and the respective salaries at the present time are as follows:

| | |
|----------------------------------|---------|
| Chief of bureau..... | \$2,400 |
| Three clerks, at \$480 each..... | 1,440 |
| Two clerks, at \$300 each..... | 600 |
| One stenographer..... | 660 |
| Total..... | 5,100 |

Duties of the bureau.—The bureau of vital statistics is required by law—

(1) To supervise the registration of births and deaths in the State; (2) to receive, file, and compile all such records; and (3) to tabulate and publish the same in such form as shall make them most valuable in the public service. It is also required to perform such other duties and exercise such other functions as the State board of health or the secretary thereof may designate. (Sec. 21f, art. 43.)

REGISTRATION OF BIRTHS AND DEATHS.

Requirements of the law.—In conformity with existing law, the secretary of the State board is State registrar of vital statistics; the chief of the bureau of vital statistics is assistant State registrar of vital statistics; the county health officers are ex officio county registrars of vital statistics; the local health officers in towns and cities are ex officio local registrars of vital statistics.

The county is divided into registration areas, which are composed of one or more election districts. In each registration district the county registrar, with the advice and consent of the local board of health, appoints a local registrar, or the county registrar may also act as local registrar.

For the convenience of the physicians and undertakers the local registrar appoints a deputy local registrar and as many more deputy local registrars as the State registrar may consider necessary. These officials are located in the towns available to the largest number of people.

In instances of neglect or refusal to properly perform their duties, county, local, or deputy local registrars are subject to removal by the State registrar, with the advice and consent of the State board of health, and vacancies so created are filled by the State registrar.

All physicians, midwives, and undertakers must register their names, addresses, and occupations with the local registrar of the district in which they reside.

A death certificate is required to be made out for every death. It is then presented to the nearest registrar and is the authority for issuing a burial or other permit.

The deputy local registrar transmits the death certificate to the local registrar at once. The local registrar transmits the original death certificates for the month to the State registrar and a transcription of the same to the county registrar on or before the 5th day of the month succeeding.

The county registrar transmits to the State registrar all transcripts received by him during the month on or before the 15th of the next succeeding month. In case of unusual mortality the State registrar can require that certificates shall be sent in daily.

Death certificates are required to be signed by the last attending physician. In case the body is viewed by a coronor, and an inquest is held, he signs the certificate.

In case of death without medical attendance, or in case of sudden or violent death in which the coroner does not deem it necessary to hold an inquest, the certificate of death is signed by the health officer, or in his absence by the local or deputy local registrar.

The official first receiving the original death certificate and issuing a burial permit is entitled to a fee of 25 cents. For each transcript the officer is entitled to a fee of 10 cents. The county registrar is entitled to a fee of 25 cents for each record of death entered in the county record (all deaths registered in the county).

The fee for belated or incomplete certificates is one-half that allowed for proper and correct certificates.

For a certified copy of a death certificate, there is charged by the county or State registrar 50 cents, plus 50 cents an hour if the time consumed is over one-half hour. This fee is paid by the persons to whom the copy is furnished. All other fees are paid by the county.

No interment, cremation, or other disposal of a body is permitted without a burial or transit permit, and no burial permit is issued without a death certificate.

In case of death by infectious disease, interment is to be made according to the rules of the State department of health. These rules are in conformity with those adopted by the conference of State and provincial health authorities of North America.

No disinterment is allowed during the months of July and August. No disinterment of a body dead of an infectious or contagious disease is allowed except by permission and under the direction of the local board of health. No disinterment can be made without a permit from the registrar. To get such a permit a certificate of death must be presented. A disinterment permit consists of a burial permit with the word "disinterment" written across its face in red ink.

Transportation of dead bodies can only be made under the rules and regulations of the State board of health. All such bodies are required to be accompanied by a transit permit, a copy of the death certificate, and a burial permit.

Births are reported in the same way as deaths. The same fees are allowed and the same penalties provided, but a different form of certificate is used. Physicians, midwives, or others must report births within four days next succeeding the birth.

A stillbirth is reported by two certificates, one a certificate of birth, giving the age as "0," and in place of the name the word "stillbirth," and a certificate of death, giving the cause of death as "stillbirth." Plural births require a separate certificate for each child.

Penalties are provided for refusing to make out certificates of births and deaths; for false certificates; for undertakers who dispose of bodies without burial or removal permits; for refusal of county, local, or deputy registrars to enforce the provisions of the registration act; for altering certificates without authority; for furnishing false information; for imparting information to unauthorized persons; and for failure to register.

From the city of Baltimore, certificates of births and deaths are not required to be sent to the State registrar, but only such transcripts, tables, figures, and compilations as he may deem necessary. (Sees. 6 to 19b, art. 43, Act of 1912, chap. 696.)

In addition to the above, chapter 124 of the Acts of 1906 adds section 18a to article 43 of the Public General Laws of Maryland and provides that where any local registrar is not making full and complete returns, the State department of health may take full charge of the registration office for three months after giving the local board of health 30 days' notice. If, then, the registration returns show an increase of 10 per cent or more over the registration returns of the corresponding three months of the year next preceding, the expenses shall be paid by the local board of health. If less than 10 per cent increase, the State department of health pays all expenses.

Collection and disposition of reports.—The entire State has been divided into registration districts composed of one or more election districts, depending upon the population. The county boundaries have been preserved in forming these districts. There are 23 counties, each with a county registrar, 240 registration districts, each with a local registrar, or 240 local registrars in all; and, in addition, 210 deputy local registrars. The registration districts are numbered from 1 to 355, numbers being purposely omitted in each county to permit of further subdivision where increase of population or other reason would make it desirable. The city of Baltimore forms a separate district, the commissioner of health acting as local registrar, but certificates received by him are not sent to the State registrar.

The death certificate, after receiving the proper signature, is given to the undertaker. The latter takes it to the nearest registrar, who examines it to see that all the information required has been given, and then issues a burial permit, and a transit permit if required. The burial permit is valid in any part of the State. The burial permit is taken to the sexton of a cemetery or other person in charge of an authorized place where a body is to be disposed of. He enters the necessary data in a book furnished for the purpose and places the date of interment over his signature on the back of the certificate, which is then returned within 10 days to the local registrar of his district.

The deputy local registrar keeps a duplicate of the burial permit but does not keep a record of the death certificate, which is forwarded to the local registrar immediately, who in turn makes a transcript of it. The original is sent to the State registrar and the transcript is forwarded to the county registrar on or before the 5th day of the following month, who enters the full information in a book which becomes part of the county records. These transcripts are then sent to the State registrar on or before the 15th day of the following month. As has already been mentioned, death and birth certificates originating in Baltimore city are filed in the health department of the city, and neither original nor transcripts are sent to the State registrar, a summary or other statement being submitted monthly and at the end of the year.

Upon the receipt in the bureau of vital statistics of the original death and birth certificates for the month from the local registrars, the date of their receipt is entered in a book and stamped on the certificate. A separate record on a blackboard is kept of the receipt of transcripts from county registrars.

When the local registrar's certificates are not received in the State department of health by the 8th day of the following month they are classed as belated certificates. When the county registrar's certificates are not received by the 18th day of the following month they are classed as belated certificates. When received they are filed in a

temporary file according to counties and months. They are then carefully inspected, and if there is any missing information a letter is addressed to the doctor directing him to supply it.

An original certificate once received, never leaves the office. If, for instance, the signature of the physician is omitted from a death certificate, a copy of the certificate is sent for his signature, and this, when returned, filed as the original. Upon receipt of missing information, it is inserted on the original certificate in red ink.

The necessary information having been compiled for statistical purposes, the certificate is then placed in a permanent file arranged according to years and counties, with names in alphabetical order.

The transcripts of certificates, when received from the county registrars, are compared with the originals and then filed and kept for one year, after which they are destroyed, being of no further value.

As the United States Census Bureau is in the best position to reach the most people, Maryland, which is included within the registration area for mortality statistics of the Census Bureau, now submits, through its State department of health, transcripts of its certificates to that bureau, so that mortality statistics for the States as a whole may be published.

The transit permit is similar to the form used in other States and is made up of four parts, in duplicate, as follows:

Original:

1. A certificate of the local registrar.
2. A permit of the local board of health. (These are detached and delivered to the person in charge of the corpse.)
3. A certificate of the undertaker.
4. A space for information to be given to the station agent over his signature. (A paster to be placed on the coffin.)

Duplicate:

1. }
2. } Same as above, to be sent to the general baggage agent by the local agent, who
3. } forwards it to the State board of health.
4. }

On the back of the duplicates are the rules for the transportation of dead bodies and a letter of explanation to railroad agents, station and train baggagemen. This duplicate when received by the State department of health is acknowledged and filed away for future reference.

A standard form of death certificate, so that registrars throughout the country will report all the necessary information in the same way, has now been adopted by all those States and cities within the registration area for mortality statistics, including Maryland.

A standard form of birth certificate is greatly needed. The form used in Maryland is deficient in certain particulars, as, for instance, whether the birth is legitimate or illegitimate, the number of children living over two years of age, the name of physician or midwife in

attendance, and the date on which the certificate is made out. It is advisable to have it in the same form as a death certificate, with a margin for binding.

Dead bodies from States other than Maryland are accompanied either by a transit permit from that State, or not infrequently merely by a letter of identification from the physician in attendance, which, while not an official paper, has to be accepted as such under the circumstances.

It appears that the vital statistics law states in one place (sec. 8, art. 43) that—

No sexton or person in charge of any premises in which interments are made shall inter or permit the interment or other disposition of any body unless it is accompanied by a burial, removal, or transit permit, etc.

This, then, gives authority to inter a body with either a burial permit or a transit permit. In another place it provides that all transit permits shall be accompanied by a burial permit. (Sec. 11, art. 43.)

When, however, bodies come from other States, they are not accompanied by a burial permit, and the bodies are interred under the authority of section 8, article 43, the local registrar frequently not knowing that an interment has taken place until he receives the transit permit from the sexton, and not then if the sexton forgets to forward the permit. There is therefore a discrepancy in the law which should be changed so that a burial permit would be required before any body from another State could be interred. This is, however, a minor detail which, with a few other small discrepancies, should be readily changed during the coming session of the legislature.

Record of fees.—At the end of each month county registrars are required to send in a statement as to the total number of births and deaths collected and entered in the county records. Local registrars must transmit a statement of the total number of originals collected by them, and the total number of transcripts sent to the county registrars. Deputy local registrars must submit a statement of the total number of certificates collected by them. The statements are compared in the State department of health with the number of certificates and transcripts actually received, and a voucher is made out for each registrar quarterly, showing the exact amount that is due him. This is presented to the county commissioners for payment. A press copy is made of this voucher in the State department of health.

The State and county registrars may issue certified copies of birth and death certificates upon application and payment of the proper fee.

The certificate of birth or death may cost the county 60 cents, i. e., 25 cents for the original, 10 cents for the transcript, and 25 cents for

entering it in the county records. The average cost of a certificate, taking into consideration that a certain number of them are faulty or belated, is about 51 cents.

Information as to whether a birth or death has or has not been reported is frequently determined by comparing the certificates received with the notices of births and deaths published in the numerous newspapers throughout the State. When such a notice is published and no certificate is received, a letter is addressed to the county health officer requesting him to look up the facts in the case and report. Sufficient evidence is frequently obtained to prosecute the offending person.

Compilation and tabulation.—While compilation and tabulation of data are carefully and thoroughly done, there always exists that chance for error where many figures are being handled—a thing not infrequently difficult to detect, as one error may correct another. Hand compilation is laborious and time-consuming, and much time and labor can be saved and the chance for errors decreased to a minimum by the use of the tabulating machine. These machines are not in the market for sale but may be rented at a cost which would make it worth while to install them.

THE MIDWIFERY ACT.

In addition to the duties already mentioned, the bureau of vital statistics of the State department of health is charged with the enforcement of the midwifery law.

Requirements of the law.—All midwives practicing within the State must register their names and addresses with the local registrar of vital statistics for the city, town, or county in which they reside. Such registration, however, does not entitle them to practice without a license and certificate.

All midwives practicing prior to July 1, 1910, may be given a license and certificate without examination. All midwives practicing subsequent to July 1, 1910, must pass an examination before they are entitled to a license and certificate.

Examinations are held in May and November in the city of Baltimore before the State department of health and in the different county seats before the local health officer of the city, town, or county.

Such examinations must be advertised once a week for four weeks previous to the date for examination.

To take an examination an applicant must pay a fee of \$5, which entitles her in case of failure to a reexamination within 12 months.

Applicants must know how to read and write and make out a proper birth certificate, and must present a certificate showing their experience and that they are of good moral character.

The registration is made by the different registrars. The license is issued by the clerk of the circuit court of Baltimore city, or the clerk of the circuit court of any county. The certificate is issued by the State board of health.

The law provides that midwives in their practice shall not make any internal examinations, as, for instance, a vaginal examination, nor shall they perform any kind of surgical operations, such as the use of forceps.

It also requires that if the eyes of any child within two weeks after birth become inflamed or swollen they shall use no application themselves, but shall immediately notify a physician or the health officer. A penalty is provided for failure to give notification or for any violation of any provision of the act. (Secs. 55a to 55p, art. 43.)

Administration of the law.—Any midwife desirous of practicing and who has practiced prior to July 1, 1910, requests the local registrar of vital statistics to present her name to the county health officer. The county health officer inquires into her skill as a midwife and her character, and submits in proper form a certificate that she has practiced prior to July 1, 1910, and is qualified to be licensed and registered. Upon receipt of this the State department of health issues to her a certificate of qualification, which she presents to the clerk of the circuit court, who in turn gives her a license. This license is presented to the county health officer, who registers her name, address, color, nationality, date of license and where issued, and qualifications.

A transcript of this registration is submitted to the State department of health. This department then forwards to the midwife a certificate permitting her to practice. If she has not practiced prior to July 1, 1910, a similar procedure is used, but before receiving a license and certificate she must undergo an examination, and a different form of certificate is then given, stating that she has successfully undergone the examination and is entitled to practice.

This law seems unnecessarily cumbersome. It will be noticed that a midwife wishing to carry on her calling must first present her name to the county registrar and ask him to request the State department of health to give her a certificate to practice; second, the county registrar, after an investigation as to her ability and character, reports to the State department of health; third, this department then sends her a paper which entitles her to be licensed by the clerk of the court. This does not permit her to practice, however, for she must then (fourth) take her license to the county registrar and be registered. Neither is this her authority to practice, for a transcript of her registration is then sent to the State department of health, which then (fifth) either after an examination or otherwise, issues to her a certificate to practice midwifery.

It is the experience all over the world that dealing with the question of midwives is difficult, mainly on account of their ignorance and lack of intelligence. Many of them not understanding the requirements of the law, avoid complying with it for fear they will not be able to stand the tests and will be put out of business, but they continue to practice and evade the penalty on the plea that they were called in as a friend of the family and charged no fee for their services.

It is desirable to have a law which is devoid of complicated procedures. In the present instance it would seem entirely unnecessary for the midwife to be licensed by the clerk of the court of the county in which she wishes to practice before receiving her certificate, inasmuch as the determination of her professional ability and her character rests entirely with the State department of health, and her right to practice is dependent upon these things. After she has been granted the privilege to practice within the State (not any particular county), it is then within the rights of the county, if it so wishes to require that if she desires to practice in that county she must be licensed, and even to charge a fee for such license. This, however, is a matter that should not concern the State department of health and should have nothing to do with the granting of the right to practice, which is based upon professional knowledge and good character; however, the law is accomplishing results perhaps as good as can be expected, and no law on the subject can be made with the expectation that perfect results will follow, but only that conditions will be improved as much as possible under the circumstances.

After a study of the work and personnel of the bureau of vital statistics, one comes to the conclusion that the personnel is efficient, and that the results obtained are accurate and as complete as can be expected until physicians and others appreciate the value of the registration of births and deaths.

Maryland is now in the registration area for mortality statistics, which according to the Twelfth Census of the United States, Volume III, Part I, Paragraph XXXVIII, means those areas in which the registered deaths constitute 90 or more per cent of the total deaths.

The scope of the bureau is too limited, however, and should be broadened to include the compilation and tabulation of morbidity reports, as well as reports of marriages and divorces.

There is perhaps a lack of energy among registrars in the county, but this would be overcome by a reorganization of the county health units, placing the county health officer directly under the control of the State department of health, and by the appointment of an inspector, one of whose duties it would be to travel through the State and supervise the work of the local registrars.

Table of information relating to birth and death registration in counties of Maryland, year ended June 30, 1913.

| County. | Area. | Population estimated for the year 1912. | Number of registration districts. | Number of registered deaths. | Number of birth certificates. | Amount expended in birth and death certificates. | Number of registered physicians. | Number living in other States, but practicing in Maryland. | Number of undertakers. | Number of cemeteries with sextons. | Number of cemeteries without sextons. | Number of registered midwives. |
|---------------------|---------|---|-----------------------------------|------------------------------|-------------------------------|--|----------------------------------|--|------------------------|------------------------------------|---------------------------------------|--------------------------------|
| Allegany..... | 440.5 | 64,155 | 14 | 29 | 922 | 1,640 | 80 | 7 | 14 | 34 | 12 | 40 |
| Anne Arundel..... | 430.4 | 39,540 | 7 | 17 | 789 | 1,019 | 55 | ..... | 21 | 20 | 24 | 60 |
| Baltimore..... | 646.8 | 128,668 | 15 | 32 | 1,945 | 2,249 | 150 | 3 | 22 | 81 | 14 | 49 |
| Calvert..... | 216.8 | 10,343 | 3 | 8 | 296 | 296 | 12 | ..... | 9 | 27 | ..... | 41 |
| Caroline..... | 317.4 | 19,810 | 8 | 15 | 306 | 422 | 20 | ..... | 14 | 16 | 4 | 37 |
| Carroll..... | 445.3 | 33,949 | 14 | 29 | 516 | 635 | 55 | ..... | 17 | 45 | 34 | 3 |
| Cecil..... | 374.6 | 23,578 | 7 | 14 | 366 | 406 | 34 | 2 | 15 | 38 | 4 | 9 |
| Charles..... | 462.0 | 16,131 | 9 | 17 | 310 | 551 | 16 | ..... | 10 | 28 | 13 | 63 |
| Dorchester..... | 573.2 | 28,810 | 11 | 19 | 547 | 750 | 27 | ..... | 15 | 77 | 4 | 67 |
| Frederick..... | 660.0 | 52,823 | 25 | 48 | 871 | 1,116 | 79 | ..... | 29 | 85 | 7 | 16 |
| Garrett..... | 681.0 | 20,586 | 14 | 23 | 202 | 514 | 14 | 12 | 15 | 31 | 12 | 4 |
| Harford..... | 439.8 | 27,905 | 7 | 15 | 410 | 426 | 41 | 2 | 12 | 35 | 1 | 16 |
| Howard..... | 249.1 | 15,985 | 6 | 13 | 219 | 358 | 24 | ..... | 9 | 23 | 7 | 28 |
| Kent..... | 281.0 | 16,591 | 6 | 12 | 305 | 377 | 24 | ..... | 6 | 22 | 9 | 51 |
| Montgomery..... | 517.6 | 32,418 | 15 | 31 | 390 | 573 | 49 | 1 | 11 | 49 | 13 | 41 |
| Prince Georges..... | 479.6 | 37,398 | 19 | 34 | 550 | 933 | 49 | 2 | 20 | 33 | 12 | 41 |
| Queen Annes..... | 363.4 | 16,534 | 6 | 11 | 306 | 337 | 22 | ..... | 9 | 21 | 10 | 30 |
| Somerset..... | 328.6 | 23,953 | 9 | 20 | 400 | 600 | 25 | ..... | 11 | 34 | 13 | 32 |
| St. Marys..... | 369.1 | 19,607 | 8 | 17 | 183 | 344 | 17 | ..... | 8 | 25 | 4 | 38 |
| Talbot..... | 267.1 | 19,475 | 5 | 11 | 334 | 328 | 26 | ..... | 6 | 14 | 5 | 35 |
| Washington..... | 457.3 | 50,513 | 17 | 32 | 756 | 1,340 | 72 | ..... | 27 | 69 | 4 | 22 |
| Wicomico..... | 368.9 | 27,607 | 9 | 15 | 378 | 444 | 25 | 3 | 11 | 33 | 5 | 16 |
| Worcester..... | 491.5 | 22,036 | 6 | 11 | 326 | 442 | 23 | 1 | 13 | 19 | 5 | 27 |
| Total..... | 9,861.0 | 748,415 | 240 | 473 | 11,492 | 16,100 | 939 | 34 | 324 | 859 | 216 | 738 |

The city of Baltimore is not included in the above table.

Bureau of Sanitary Engineering.

The bureau of sanitary engineering of the State Department of Health of Maryland was organized in 1912 under authority of section 21a of chapter 560 of the Acts of 1910. Section 21g authorizes the employment of a chief and assistant chief. At present its authorized personnel, with their respective salaries, are as follows:

| | |
|--|--------------|
| Chief of bureau..... | \$2,400 |
| Assistant chief..... | 1,700 |
| Assistant engineer..... | 1,400 |
| Assistant engineer (resigned Oct. 1; position not yet filled)..... | 1,080 |
| One stenographer..... | 720 |
| Do..... | 420 |
| | <hr/> 17,720 |

Its duties under section 21e of the above law are defined as follows:

1. To examine into all public and private systems of water supply and prepare proper maps and drawings of the same for permanent record.
2. To examine and patrol as far as possible the watersheds or catchment basins of all public water systems, and investigate and report upon all sources of pollution of public and private water supplies.
3. To investigate and report upon all private and public systems of sewage disposal.
4. To inquire into and investigate the water supply, sewage disposal, ventilation, heating and lighting of schools, asylums, jails, and other public institutions.
5. To inquire into and investigate offensive trades and nuisances, disposal of trade wastes, sewage, and other offensive matters, and devise means for their control.
6. To perform such other duties and exercise such other functions as the State board of health or secretary thereof shall designate.

Requirements of law.—In addition to the acts mentioned above and those laws previously mentioned relating to the abatement of nuisances, the following have a bearing on the work of the bureau of sanitary engineering. Section 429, article 27, of the Public General Laws of Maryland, makes it a misdemeanor, punishable by a fine of not more than \$200, to permit any filth, animal or vegetable, sewage, etc., to enter any stream, pond, or spring, etc., which furnishes a water supply to any city, town, village, community, or household, and after a reasonable notice, not exceeding 15 days, from the State or any local sanitary authority to discontinue the act whereby such water is fouled, a further sum of not more than \$50 for every day during which the offense is continued.

It is prohibited for any person to willfully and maliciously injure any ice upon any pond or stream of water so as to injuriously affect the quality of the same as an article for sale or use, or to willfully or maliciously cast or discharge upon any such ice any substance

¹ Ten draftsmen and assistants employed at various periods this fall on main drainage work near Washington, of whom three have worked for a few hours only. Rate of pay, 43 cents per hour. One assistant on same work since Oct. 1 at \$30 per month. Figures not included in total salaries as given above.

whatever which shall injure the same. For violation there is a fine of not less than \$10 nor more than \$20. (Sec. 55, art. 27.)

An act passed in 1894, chapter 511, requires the board of school commissioners in every city and county of the State to provide suitable and convenient toilet arrangements for each of the schools under their official jurisdiction; not less than two for each school or building when both sexes are in attendance, with separate means of access for each; and they shall be kept clean and comfortable. For failure on the part of the said public school commissioners to comply with the provisions of this act they are liable to be removed from office.

The bureau has been in operation only since May, 1912, but is already well started in the study of water supplies and the disposal of sewage within the State. Many maps have been prepared and many have been received from local authorities.

While the law gives the bureau numerous duties, it has failed to clothe it with any powers of control. The State as a whole is far behind the times so far as modern water-supply and sewage-disposal systems are concerned, as clearly indicated by the high typhoid rate.

The State government has no power to insist on a pure-water supply, or a proper disposal of sewage until the lack of same reaches the proportions of a nuisance, when it may step in and, by the cumbersome method already alluded to, take action, with no great prospect of success, and a very great probability of long delay.

Except in Baltimore County, where there is a local ordinance, there is no provision made whereby plans for a water supply or sewerage system for any community or household, shall be approved by the State department of health, so that at present any sort of an installation may be made regardless of its utility or cost, and thus the people may be compelled to pay for something from which they may not derive the expected amount of benefit.

The great value of such a law has only recently been shown in Baltimore County, which has an ordinance requiring that all plans must first be approved by the State department of health. In this instance, by taking a firm stand, the State prevented the county from purchasing for \$600,000 an \$80,000 sewerage system, entirely inadequate for its purpose, thus saving the citizens of the county a large sum of money.

In the State of Maryland there are a number of privately owned water systems supplying the smaller towns. These are especially hard to handle as the element of profits to the company must be considered, making it difficult to institute reforms.

There is a great need of a law giving the State control over the water-supply and sewerage systems, public and private, throughout

the State and making it compulsory to have all plans for all proposed construction approved by the State, and the power to require necessary alterations in already existing installations without waiting for a nuisance to arise and before the health of the community is jeopardized.

The present bureau is not concerned with plumbing, nor does it seem necessary that it should be, except in the case of public buildings. Plumbers are licensed as master plumbers by the State board of commissioners of practical plumbing, which has no connection with the State department of health.

The question of nuisances in connection with the bureau of engineering has already been considered.

All plans for proposed public buildings, or changes in the heating, lighting, ventilation, or disposal of sewage of existing buildings should be required to be submitted to the bureau of sanitary engineering for approval. This should include all public schoolhouses erected within the State.

Although the bureau is greatly handicapped in not having sufficient help in the field, some very important field work has nevertheless been carried on, probably the most important being a survey of the territory surrounding the District of Columbia. This is not yet finished and is being done for the purpose of determining the best method for the disposal of sewage from that territory.

The bureau of sanitary engineering should have representative engineers in the field, under some designation such as district engineers and inspectors, just as the bureau of communicable diseases should be represented by county or district health officers. The district engineer and district health officer must cooperate, for it is only by cooperation that success will attend the operations of the department.

The present bureau, though small, is well organized and is unquestionably capable of doing much good for the health of the people of the State, provided it has adequate laws giving it adequate powers and a sufficient appropriation.

It must be remembered that the work of the bureau of sanitary engineering, so far as the advancement of public health is concerned, is probably equaled only by that of the bureau of communicable diseases, and for large operations that secure lasting and telling results is probably equaled by no other bureau.

Bureau of Bacteriology.

While a bacteriologist had been employed for about 12 years, a bureau of bacteriology was not authorized until 1910, when the act was passed reorganizing the State board into a State department of health and authorizing the creation of certain bureaus. The personnel

of the bureau and their respective salaries at the present time are as follows:

| | |
|------------------------------------|-------------|
| Chief of bureau ¹ | \$1,800 |
| Assistant chief..... | 1,800 |
| One laboratory assistant..... | 500 |
| Do..... | 300 |
| Do..... | 240 |
| Do..... | 208 |
| One stenographer..... | 600 |
| | <hr/> 5,448 |

Duties of the bureau.—The duties as defined by the above-mentioned act (sec. 21c, art. 43) are as follows:

1. To conduct inquiries into the nature, source, and vehicles of infectious diseases.
2. To establish and maintain, under the direction of the State board of health, a properly equipped laboratory.
3. To extend its services free to all local boards of health and to all practicing physicians of the State for such inquiries concerning infectious and contagious diseases as the said board may from time to time direct, and to the vaccine agent for testing vaccine virus.
4. To examine into and analyze public and private water supplies, milk, and other foods.
5. To perform such other duties and exercise such other functions as the State board of health or the secretary thereof shall designate.

In actual practice the bureau of bacteriology or the bacteriological laboratory of the State Board of Health of Maryland is concerned with all the duties ordinarily required of such a laboratory, namely, bacteriological investigation of water and foods, including milk, the examination of pathological materials, the manufacture of biologic products, and original research along the lines of public health.

This particular bureau is a very important part of a health department which could not be dispensed with and one worthy of description in greater detail than can be here given to it. To describe it properly it would be necessary to go into technical details, which is deemed unnecessary.

At present the bacteriological laboratory is used in common by the State and by the city of Baltimore, each paying its share of the expenses. This would seem to be an economical arrangement; although, given sufficient funds, it would seem reasonable to have the State laboratory do all the work for the city of Baltimore, just as it now performs certain functions for the State as a whole. Extra work performed for the city, however, outside of the ordinary routine, might be paid for by the city at a rate satisfactory to both parties.

Much of the work of the bureau is concerned with the diagnosis of the acute communicable diseases—typhoid fever, diphtheria, and rabies—and with the more chronic communicable disease, tubercu-

¹ The chief of the bureau receives also \$1,800 from the city of Baltimore, making his salary total \$3,600.

losis; and inasmuch as it is absolutely necessary to secure prompt reports of results, the findings are transmitted from the bureau of bacteriology direct to the physician who submitted the specimen for diagnosis. These examinations are made free of charge.

The culture stations which have been referred to in a previous chapter are supplied with mailing outfits by the bureau of bacteriology. One of these outfits is intended for use in the transmission of sputum for examination, and contains a sterilized wide-mouth bottle with glass stopper, partly filled in the laboratory with a disinfectant solution. When one of these bottles is received in the laboratory its contents are mixed with antiformin and ligroin, and the usual method is pursued for demonstrating tubercle bacilli. The bottle is immediately sterilized. Thus the entire process is carried out without removing the contents from the bottle, except to make the necessary smear.

Another outfit is intended for the transmission of swabbings for demonstrating the presence of diphtheria bacilli, and consists of a test tube, in which is inclosed a sterile swab. Loeffler's blood serum is inoculated from this swab after it reaches the laboratory. In the case of the city of Baltimore the mailing outfit contains a tube of Loeffler's blood serum in addition to the swab, and the physician inoculates the culture medium.

A third outfit contains a small aluminum box and a few glass cover slips. These are intended for the transmission of blood for the Widal reaction, or the making of blood smears of suspected malaria. The last mailing outfit supplied contains, in addition to the box and cover slip, a bile-culture tube to be inoculated either with blood from the patient or with feces or urine.

The container for all of these articles is of an approved type for mailing, and with each is transmitted the necessary information. When these outfits are sent out a record is made on a filing card, one card being used for each station; and when they are returned by a physician the station from which they were obtained is debited, the same card being used for the purpose. In this way a check can be kept on the supplies being issued from any particular station and new supplies sent as needed. When physicians reside some distance from a culture station they are supplied with mailing outfits direct from the laboratory. A separate file is kept of supplies sent to physicians.

The containers for the transmission of samples of water or milk for bacteriological examination consist of a galvanized-iron box with a cover and lock; within this box on two opposite sides is a series of compartments which hold the glass-stoppered bottles in which is put the material for examination, and a center compartment which is filled with ice. An inside cover holds the bottles in place. The

entire package is sterilized before it leaves the laboratory. The box is not supplied to culture stations, but is sent to any individual on request, and is returned by express with certain required information.

It seems to be quite satisfactory in the case of water, but not so in the case of milk. Where milk is being transmitted, additional ice should be placed in the special compartment from time to time to maintain the proper degree of temperature of the milk and to prevent multiplication of organisms and the consequent inaccurate result.

In making examinations by staining for bacteria, five smears from different cases of the same disease are made on the same slide. Slides are used several times, after thorough cleansing, but never twice when the same organisms are to be identified.

Stained slides are filed in the laboratory for at least two weeks, in case it should be necessary to refer to them the second time for a confirmation of diagnosis.

The laboratory is open at all times of the day and night to receive material for examination. The attendant who remains there at night has been trained to make the necessary inoculations of culture media from swabs. On Sundays and holidays a bacteriologist is on duty for a sufficient time to do the routine work.

For each examination a card of information is filed and the result of the examination noted, together with how these results are sent out, whether by mail, telegraph, or telephone, and the time sent. Regular printed forms are used for transmitting the results to physicians when sent by mail. Results are always obtained and transmitted promptly.

On account of the skepticism of some physicians and the dislike which some of their patients have for quarantine and disinfection, the laboratory is in the position of having its accuracy tested by what might be termed underhand methods. For instance, not long since it received from a practicing physician in the State of Maryland two swabs accompanied by the customary information and purporting to have come from the throats of diphtheria patients. After examination the diphtheria bacillus was found and the cases reported as positive. The doctor who submitted the swabs claimed that such findings were ridiculous, as he sent two swabs which he had never inoculated with any material, not even having taken them out of their original container. On investigation it was found that he had obtained in all four swabs from the culture station and that he took swabbings from the throats of two of his patients who clinically had diphtheria. Without going into detail, it may be said that the evidence was strong that in his attempt to deceive the bureau of bacteriology this man had gotten his four culture tubes mixed and

actually sent the two which he had inoculated from the throats of his patients, instead of the two which he supposed were blank.

It is true that the bureau of bacteriology, like other laboratories, may make mistakes, but it is well equipped, is in charge of a highly capable man, and unquestionably performs excellent work.

The only biologic product which is manufactured in the laboratory is typhoid vaccine, which is issued free of charge to the physicians of the State.

The advisability of establishing a few branch laboratories equipped for routine examinations should be carefully considered by the board of health. Such laboratories situated in the more thickly settled parts of the State distant from Baltimore would greatly facilitate and expedite the work of examination of specimens submitted by physicians and thus render them considerable aid. The bacteriologist could be appointed as assistant to the district health officer formerly mentioned and the cost of equipment would not be great.

Bureau of Chemistry.

The bureau of chemistry of the State department of health of Maryland was established under authority of chapter 560 of the acts of 1910 (sec. 21a, art. 43), although as early as 1887 a chemist had been employed. Section 21g authorizes the appointment of a chief and assistant chief. Its personnel and their respective salaries at the present time are as follows:

| | |
|--------------------------------|---------|
| Chief of bureau..... | \$2,500 |
| Assistant chief of bureau..... | 2,500 |
| One assistant chemist..... | 1,000 |
| Do..... | 800 |
| One laboratory assistant..... | 420 |
| One stenographer..... | 600 |
| | <hr/> |
| | 7,820 |

Duties of the bureau.—Section 21d defines the duties of the bureau as follows:

1. To conduct inquiries into the nature, source, and vehicles of infectious diseases, and into the nature and character of sewage, trade wastes, and into nuisances.
2. To examine and analyze free of cost, samples from public and private water supplies, milk, and such other foods, drinks, confectionery, drugs, spices, and condiments, as the board shall direct.
3. To establish and maintain, under the direction of the State board of health, a properly equipped laboratory.
4. To perform such other duties and exercise such other functions as the State board of health or the secretary thereof shall designate.

At present all correspondence relative to analyses of private water supplies is attended to by the bureau of chemistry. The samples come direct to the laboratory, addressed to the chief of the bureau. The chemist who makes the examination sends the results

to the chief chemist on a mimeographed form containing the details of examination. The results are then calculated by the chief of the bureau, and the necessary information transcribed to a card, which is then filed away as a record with the mimeographed form containing the details. The information is also transcribed to a special printed form, which is submitted to the person requesting the analysis. With this is also inclosed the results of bacteriological examination on a separate form and a leaflet on the subject of anti-typhoid vaccination. Every sample of water submitted for examination is required to be accompanied by certain information, and a blank form is furnished for that purpose. When this information does not accompany the sample a letter is addressed to the person submitting the sample requesting it. With this letter there is also inclosed a booklet concerning the collection of samples of water.

The bureau of chemistry is at present making many examinations of private water supplies in different parts of the State. While the department is, of course, established to assist the public, it at times happens that this examination involves the department in private lawsuits, where nothing can be gained in advancing the public health; a number of employees are sometimes subpoenaed as witnesses in these cases and thus valuable time lost to the department. Samples of water should be examined for private individuals only when they come through and at the request of the county health officer, and then only when in his opinion such an analysis is deemed necessary or desirable in the interest of the public health.

In the case of samples of food and drugs submitted for examination by the State food and drug commissioner, the chemist who makes the examination transmits a report in detail on a mimeographed form to the chief chemist, who in turn sends a statement of the results without the details to the State food and drug commissioner by letter. The mimeographed form with details, as in the case of water, is filed away for use in court if prosecution is instituted, or a hearing ordered.

A chemical laboratory of any health department is chiefly concerned in the examination of foods and drugs for the division of foods and drugs, and in the analysis of water, sewage, and trade wastes, in which it cooperates with the bureau of sanitary engineering. It at times may make analyses of other things, as, for instance, disinfectants for the bureau of communicable diseases, and may in its spare time perform original investigations involving chemical problems of interest from the standpoint of public health. Thus a chemical laboratory is really concerned in cooperating with or assisting other bureaus, and its direct responsibility in such matters ceases when it has obtained accurate results and transmitted them to the proper bureau. This interest may be revived, so to speak, when it becomes necessary to testify in court relative to any analysis made.

As the chemical laboratory's functions are to assist other bureaus in their work, there should be little necessity for outside correspondence, and the chemist's time should be spent in the laboratory rather than in the office.

The results of examinations, if they are given out, should be made known by the bureau requesting the analysis. For instance, results of water analysis should be transmitted to the chief of the bureau of sanitary engineering by properly filled-in forms; and letters giving judgment or advice in respect to waters tested should be sent out from the bureau of sanitary engineering, which is concerned in the control of water supplies. The same procedure should be followed with regard to foods and drugs, except that the results of analysis should be sent in proper form to the chief of the division of food and drugs.

As a matter of expediency, samples of water should be delivered direct to the laboratory, thus avoiding delay in their examination.

In order to check the work of the examining chemist, the chief chemist desires all data collected in connection with a water sample. As, for instance, the proximity of privies and pigpens or stables to the source of water supply, character of soil and direction of drainage, etc. While this information is essential in interpreting the results of the analysis, it should have no bearing on the analytical procedure, which is a clear-cut chemical problem, and the results should be the same whether such data are at hand or not; and there should be some better way, by personal supervision if necessary, to determine that the analyst is performing accurate work.

Many analyses in the laboratory are made with the ultimate object of bringing prosecution in case adulterations or contaminations are found. It would seem that the results of such an analysis stated in proper form over the signature of the chief of the bureau, the responsible head, would have more weight in court than pencil notes made by a subordinate at the time of examination, especially when it is remembered that the subordinate's figures are checked and the final calculations are made by the chief himself. This is not the case, however, and it is necessary to keep all pencil notes of the analysis step by step. These pencil notes are considered the original records, and therefore must be filed for future use. No case is brought up for prosecution until the findings are checked by a second analysis made by another chemist of the bureau.

A simple and satisfactory form for requesting examination and reporting the results is suggested as follows: On one side of the blank form should appear the request, on the other side a place for reporting results. The chemical laboratory should analyze such products as are received with a request for analysis signed by the chief of the bureau making the request; the results of analysis should be initialed by the chemist making the analysis, signed by the chief chemist, and

returned to the bureau making the request. Each one of these requests should be made in duplicate and given a laboratory number, the duplicate to be filed in the bureau of chemistry with the pencil notes of the analyst. No other record or any correspondence is necessary. It is more satisfactory to have one form for water analysis and another for all other analyses, and in the case of water the request should clearly state what kind of water (whether artesian well, dug well, spring, river, etc.) and the locality.

The laboratory is well equipped and capable of performing any analysis which is likely to be required.

It is supported, except for the salary of the chief chemist, from the funds of the division of food and drugs.

In some places a chemical laboratory is combined with the division of food and drugs, this combination requiring but one chief and one clerical force and being more economical. It would seem to be a good arrangement. In some States the analysis of sewage and water comes directly under the control of the sanitary engineer.

Division of Food and Drugs.

A food and drugs act (chap. 156 of the Public General Laws of Maryland) was passed in 1910, and accordingly, in order to carry out its provisions, a division of food and drugs was established in the State department of health. The personnel of this division and their respective salaries at the present time are as follows:

| | |
|---------------------------------------|--------------|
| State food and drug commissioner..... | \$2, 500 |
| One stenographer..... | 900 |
| Four inspectors, at \$900..... | 3, 600 |
| | <hr/> 7, 000 |

Requirements of the laws.—The food and drugs act of Maryland is based on the Federal food and drugs act, with certain minor changes. It provides for a State food and drug commissioner at a salary of \$2,500 per annum, whose duty is exclusively the administration of the law under the direction and supervision of the State department of health. It provides that the examination of specimens of food and drugs shall be made in the laboratories of the State department of health and under the direction or supervision of the commissioner. It provides that in the case of adulteration or misbranding, parties shall be given a hearing, and, if deemed necessary, the State department of health shall certify to the State's attorney of the county or the city of Baltimore that the law has been violated.

The standards adopted for the enforcement of the law are those heretofore adopted by the United States Department of Agriculture, with the exception that ice cream shall contain not less than 4 per cent of butter fat and that fresh eggs and not exceeding 1 per cent

of gelatin, gum tragacanth or vegetable gum may be added without a statement of such fact.

There is also a requirement that disinfectants must be labeled with the carbolic-acid coefficient.

Drugs, with the exception of opium preparations, may be sold if below the standard of the United States Pharmacopœia provided they are properly labeled. The United States law contains this same substandard, permitting the sale of drugs under like conditions, but does not except opium preparations.

The act also contains a provision requiring the purity and proper labeling of spring, well, or mineral water sold, produced for sale, etc., which provision the United States law does not have.

The standards that have been published by the United States Department of Agriculture since the passage of the State food and drugs act can not be adopted without further legislation. Their adoption should be authorized by an amendment to the law. The State board should be given the power to make such standards as it may deem necessary, basing them on the standards proposed by the United States. The standard for ice cream as defined in the law is extremely low. In fact a frozen product containing but 4 per cent of butter fat is not ice cream, but more properly "ice milk." This standard should be materially raised.

The standards for milk are not contained in the food and drugs act, but are defined in section 232 of article 27, which states that milk shall contain not more than $87\frac{1}{2}$ per cent of water or fluids, and not less than $12\frac{1}{2}$ per cent of milk solids of which at least $3\frac{1}{2}$ per cent shall be butter fat.

Section 233 of article 27 defines adulterated, sophisticated, or unwholesome milk as follows: When it does not contain $12\frac{1}{2}$ per cent of the milk solids, of which $3\frac{1}{2}$ per cent shall be butter fats; when any preservative has been added; when ice or water has been added; when it has been taken from a sick or diseased animal; when it has been taken from an animal 10 days before or 10 days after parturition; when it has been taken from animals fed in whole or in part on garbage or any substance in a state of fermentation or putrefaction, or food that produces impure or diseased or unwholesome milk, or from cows stabled near a house where there is an infectious disease; or any milk from which a portion of the cream has been taken. Skimmed milk, however, may be sold when plainly and conspicuously marked "skimmed milk."

For the sale of such milk, section 234 provides a fine of not more than \$100 or imprisonment for not more than 60 days or both. This section, however, does not apply to Montgomery County, except when milk from that county is shipped to Baltimore city.

Section 235 of article 27 provides that no condensed or preserved milk shall be manufactured, sold, or exchanged unless it is manufactured from pure, clean, healthy, fresh and unadulterated and wholesome milk from which the cream has not been removed either in whole or in part. It shall have the same proportion of ingredients that are contained in crude milk, and all packages must be labeled with the name of the manufacturer. For violation of this section there is a fine of not less than \$25 nor more than \$100 or imprisonment for not less than 10 days nor more than 30 days, or both.

Section 236 provides that all milk cans must have the initials of the owner, dealer, or shipper stamped or marked on them, and that they shall not be used for any other purpose than for milk or cream, and provides a fine for violation of not more than \$50, one-half of the fine going to the informer and the other half to the board of school commissioners.

The authority to condemn and order the destruction of food products is contained in sections 128 and 129 of article 43. This authorizes the State board of health or its proper officer or inspector to inspect food products at all reasonable times, and if found unfit for human consumption to order the destruction thereof, and fines are provided for failure to obey any such order.

Chapter 69, 1902, adding section 55a to article 43 of the Public General Laws of Maryland prohibits the killing of any animal for human consumption that is sick or injured, and any female animal within 30 days after delivery. The burden of proof that such animal was not intended for human food is borne by the party charged. For violation, a fine is provided of not less than \$25 nor more than \$100.

Section 237 of article 27 relates to the selling, furnishing, or giving away of cocaine, salts of cocaine, morphine, and eucaine, except under certain conditions, and provides a fine for the first offense of not less than \$25 nor more than \$50. For the second and third offense the fine is increased.

Methods of operation.—Four inspectors are employed who purchase from time to time samples of food and drugs in different parts of the State and in the city of Baltimore. At the time of purchase a receipt is given to the dealer. These samples are brought to the State food and drug commissioner with the inspector's report, which is on a regular printed form. The samples are then turned over to the chief chemist, who receipts for them and causes them to be analyzed, and the samples are kept under lock and key for future use as evidence in court. The pencil notes of the analyst containing the details are checked and final calculations made by the chief chemist. The results are sent to the State food and drug commis-

sioner by letter, the pencil notes are filed away for future use as evidence in court, and the information contained in the letter of the chief chemist is used by the State food and drug commissioner to determine whether the product is adulterated or misbranded; if so, he addresses letters to the parties concerned with a statement of facts requesting them to appear for a hearing on a certain day. They are heard before a board composed of three members—the State food and drug commissioner, the secretary, and the general counsel of the board of health.

If, after hearing the evidence, a violation of the law is believed to have occurred, it is placed before the board of health, who then decide whether or not to bring the matter before the State's attorney for prosecution.

In the counties cases for trial are brought before the justice of the peace and prompt action is usually obtained, although, of course, the defendant may demand a jury trial, when it then must be taken before the circuit court. In the city of Baltimore all cases go before the criminal court, which means great delay, and in fact little is accomplished.

The commissioner of foods and drugs is rarely called upon to testify in court, but the presence of the inspector who collected the sample, of the chemist who made the analysis, and of the chief chemist who directed how the analysis should be made, is always required.

The law should be so amended that offenders against the food and drugs act in the city of Baltimore could be prosecuted before the local magistrate. This would simplify operation and secure more rapid and effective results.

The inspectors of the department detailed to this division are concerned principally in the collection and inspection of food and drug products and the condemnation of foods unfit for human consumption. At the time of taking the samples an inspection of the premises is also made and reported upon.

Status of commissioner.—Although the commissioner of foods and drugs is to all intents and purposes a chief of bureau coming under the direction of the State board of health, on account of the food and drugs act, which specifically appoints him State food and drug commissioner, his actual status in the department would seem to be somewhat above that of a bureau chief, inasmuch as he makes his report not through the secretary, as do the other chiefs, but direct to the board in person, and he is, therefore, the only subordinate of the board who is entitled to attend the meetings. It would seem that the chief of this division should in all respects be on the same status as other bureau chiefs.

Clerical Division.

The clerical division is not authorized by any specific law, but is necessary in order to properly carry on the work of the department. The personnel, with their respective salaries, are at present as follows:

| | |
|--------------------------------------|---------------------|
| Chief clerk..... | \$1, 500 |
| 1 assistant clerk..... | 540 |
| Do..... | 216 |
| 1 chief multigraph operator..... | 600 |
| 1 assistant multigraph operator..... | 300 |
| | <hr/> |
| | ¹ 3, 156 |

This division has as its duties the care of records, finances, property, and a general supervision of the clerks and stenographers, and in some health departments is divided or subdivided into a record division, a financial division, and a property division, depending upon the magnitude of the work done.

While the clerical division of the Health Department of Maryland has in a general way all of the duties mentioned above, it is only concerned with records in so far as such records relate to the working of that division, the monthly reports of bureau chiefs, and the correspondence and reports relative to tuberculosis. These latter records are kept in the clerical division because, for the convenience of the public, the tuberculosis clerk has her office in the office of the chief clerk, it being the most easily accessible to visitors. All other bureaus keep their own reports and letter files.

The chief of the clerical division attends to the purchasing of supplies for the department except in the case of technical supplies required by the laboratories and bureau of engineering. He does not, however, assume the property responsibilities of a regularly designated and bonded property man. His responsibility ceases when he has turned the supplies over to the bureau chief for whom they were purchased, and he is not required to make any property returns.

He must keep a record of all moneys acquired or expended by the department, and account for the same by a monthly statement at the regular monthly meeting of the board of health. Like all of the bureau chiefs he makes a monthly report to the secretary. This report includes a statement of all letters sent out and received by all of the bureaus of the department, with other pertinent data and a compilation of the expenses of the department for the previous month.

He has general supervision of clerks and stenographers, in that he may temporarily assign certain work to any clerk, who for the time being has nothing to do in the particular bureau to which she is regularly detailed.

He also acts as stenographer during meetings of the board of health.

¹ Two emergency clerks employed since Dec. 1, 1913, one at \$25 per month and one at \$8 per week, and one office boy at \$4 per week.

Clerks and stenographers are at present employed by the different bureau chiefs under whom they are going to serve. Under this system the department has been fortunate in securing a capable force, but it is nevertheless uncertain. The secretary has an idea relative to the employment of clerks which seems to be good. Many times there is certain clerical work on hand at the department which can not be done on account of a lack of employees. In order to finish this a certain number of clerks could be given temporary employment only, their ability determined while so employed, and the best given permanent employment as the occasion arises. It being understood that they are temporarily employed only they could be relieved at any time if they prove inefficient or when a certain piece of work is terminated. In this way the library could be properly catalogued, etc.

The system of keeping an account of expenditures and a record of property is very satisfactory.

For a record of expenses four books are kept; a petty cash book, a cash book and voucher record, a double-entry ledger, and a purchasing ledger. In addition to this a file is kept showing the cost of articles, segregated according to the nature of the article, and a file of requisitions for money from the petty cash account with an itemized statement of traveling expenses.

To account for property there are kept several files; one of requisitions for stationery and supplies, filed by months according to bureaus; one of orders shipped and one of shipping lists. There is also kept an index of catalogues giving the price of articles commonly used by the department. Articles kept in stock consist mainly of stationery and office supplies.

When an article is wanted by a bureau chief for the use of field men, as, for instance, blank forms for registrars, an order is made out, signed by a clerk, and transmitted to the chief clerk. This is filled by an employee of the division and an entry made on the order as to how shipped, date shipped, by whom filled, name of bureau to be credited with the supplies, and each article on the order is checked by the shipping clerk as packed. When supplies are not to be shipped but used in the department a requisition is made out, signed by a clerk, and approved by the chief of the bureau requesting the supplies. If the supplies are not in stock an order is written in duplicate on the dealer quoting the lowest price and promising the quickest delivery.

At the end of the month pay rolls are made out and signed. These are totaled and together with the expenses from the petty cash account for the month entered on a voucher, made out in favor of the secretary of the State board, and transmitted with a summary of expenses for the month, certified to by the secretary, to the comptroller of the State of Maryland. He in turn returns a check drawn in favor of the secretary for the entire amount. This check is de-

posited in the bank and checked against in paying the monthly bills. Employees of the department are paid in cash from this amount. All checks are signed by the secretary.

The chief clerk has at his disposal a petty cash account of \$900, \$400 of which is to defray the petty expenses of the division of food and drugs, i. e., purchase of samples and traveling expenses of inspectors. Money for traveling expenses of inspectors or other employees of the department is advanced from the petty cash account, the employees keeping an itemized account of expenses and returning any balance to the chief clerk. The petty cash account is reimbursed at the end of each month in an amount equal to the amount expended. Correspondence of the division is filed alphabetically.

Expenses.

In the following table, showing the expenses for the period between December 31, 1912, and January 1, 1914, no attempt is made to give any balanced account. As the different appropriations become available at different times of the year, an arbitrary fiscal year must be assumed. But no matter which period of 12 consecutive months is taken there would always be some appropriations for the previous year still unused and new appropriations for other purposes coming due. This tabulation for instance, shows that \$3,829.21 was spent for the treatment of hydrophobia, which is \$1,329.21 more than the annual appropriation. This is because the yearly appropriation for hydrophobia falls due at a period somewhere between the beginning and the end of the arbitrary fiscal year and so within that year parts of two appropriations were used. This tabulation also shows that the department has expended a total of \$76,346.41, which is \$6,346.41 in excess of the annual appropriation of \$70,000. This, however, does not really mean a deficit but is explained by certain of the yearly appropriations not yet having lapsed, and therefore still available for the payment of bills. It means, however, that to remain within that appropriation some economy is necessary for the remaining months during which that particular appropriation is available. The average for any 12-months period should be \$70,000.

At the beginning of the assumed fiscal year, January 1, 1913, there was an unexpended balance of approximately \$30,000 which represented the amounts still available from appropriations which had not yet lapsed and which were needed to defray expenses until the next appropriation for the same purpose fell due. At the end of this fiscal year, December 31, 1913, there were approximately the same amounts representing the same thing. It does not mean therefore that there is actually an unexpended balance which will revert to the treasury. In fact, it is not an unexpended balance, strictly speaking, as it is the amount needed to defray the expenses of the department until the next appropriations become available.

Statement of expenditures, State department of health, fiscal year 1913.

| | Board of health and executive office. | Bureau of communicable diseases. | Bureau of vital statistics. | Bureau of sanitary engineering. | Bureau of bacteriology. | Bureau of chemistry. | Division of food and drugs. | Clerical division. | Total. |
|---|---------------------------------------|----------------------------------|-----------------------------|---------------------------------|-------------------------|----------------------|-----------------------------|--------------------|-------------|
| Salaries..... | \$8,950.98 | \$4,811.46 | \$4,646.19 | \$7,289.71 | \$5,061.93 | \$7,588.36 | \$5,275.00 | \$2,835.56 | \$46,459.19 |
| Traveling expenses..... | 220.40 | 272.86 | 228.37 | 768.95 | 16.50 | 5.00 | 1,685.39 | 271.42 | 3,468.89 |
| Books and subscriptions..... | 143.55 | 7.00 | 12.84 | 12.84 | | 7.50 | 17.49 | | 188.38 |
| Telegrams and telephone..... | 20.94 | 169.54 | 41.52 | .85 | 137.65 | | 170.70 | 188.13 | 729.33 |
| Per diem and traveling expenses, board of health..... | 275.30 | | | | | | | | 275.30 |
| Blue prints..... | | | | 50.48 | | | | | 50.48 |
| Miscellaneous..... | | 9.40 | 114.94 | 11.60 | | 3.42 | 3.65 | 389.09 | 532.10 |
| Expressage..... | | 163.61 | 16.09 | 28.79 | | 25.33 | | 27.28 | 261.10 |
| Filing cabinets and supplies..... | | 50.25 | 345.01 | 6.60 | | 95.01 | 66.15 | 55.12 | 618.14 |
| Furniture..... | | 138.25 | 81.97 | 134.37 | | 53.64 | 15.25 | 214.82 | 638.30 |
| Maps..... | | | | 23.00 | | | | | 23.00 |
| Office supplies..... | | 160.30 | 66.82 | 62.96 | 3.13 | 42.01 | 7.10 | 808.10 | 1,150.42 |
| Postage..... | | 293.55 | 315.56 | 6.85 | 103.59 | | 3.70 | 1,148.52 | 1,871.77 |
| Printing..... | | 426.60 | 920.95 | 101.50 | 146.21 | 41.87 | 187.07 | 667.20 | 2,491.40 |
| Technical supplies..... | | | | 283.59 | | | | | 283.59 |
| Typewriters and supplies..... | | 184.09 | 206.61 | 87.08 | 1.00 | 33.03 | 2.00 | 14.00 | 527.84 |
| Boxes and crates..... | | 128.58 | | | | | | | 128.58 |
| Antituberculosis supplies..... | | 4,407.04 | | | | | | | 4,407.04 |
| Laundry..... | | 16.35 | | | | | | | 16.35 |
| Multigraph and adding machines..... | | 172.25 | | | | | | | 172.25 |
| Rent..... | | 261.68 | 339.17 | | | | | 169.74 | 341.99 |
| Physicians' fees..... | | 834.50 | | | | 208.33 | 542.52 | 411.68 | 1,763.38 |
| Postour treatment..... | | 3,829.21 | | | | | | | 3,829.21 |
| Notary fees..... | | | | | | | 13.50 | | 13.50 |
| Oyster bed inspection..... | | | | | | | 99.40 | | 99.40 |
| Moving expenses..... | | | | | | 197.71 | 218.25 | | 297.11 |
| Advertising..... | | | 57.21 | | | | | | 57.21 |
| Quarterly expenses..... | | | | | 1,329.04 | | | | 1,329.04 |
| Laboratory supplies..... | | | | | 479.13 | 458.96 | | | 938.09 |
| Mailing cases..... | | | | | 216.83 | | | | 216.83 |
| Express and miscellaneous..... | | | | | 499.39 | | | | 499.39 |
| Chemicals..... | | | | | | | | | |
| Chemical apparatus..... | | | | | | | | | |
| Coal, gas, and electricity..... | | | | | | | | | |
| Drinking water, cups, and ice..... | | | | | | | | | |
| Repairs to laboratory..... | | | | | | | | | |
| Janitor's supplies..... | | | | | | | | | |
| Towel service..... | | | | | | | | | |
| Plumbing and repairs..... | | | | | | | | | |
| Insurance..... | | | | | | | | | |
| Total..... | 9,611.17 | 16,336.62 | 7,380.44 | 8,869.17 | 7,994.40 | 10,272.68 | 8,807.17 | 7,574.86 | 76,346.41 |

It will be noted that the expense of maintaining the bureau of vital statistics amounted to \$7,380.44, most of which was incurred in the collection and compilation of reports of births and deaths. These reports in addition to their value to the health department have an even greater value for purposes not connected with the public health, as, for instance, the value to the individual in enabling him to establish his legal status, and it is hardly fair to charge the entire amount against expenses for public health. The bureau of vital statistics receives from the legislature an appropriation of \$5,000 and the difference between that amount and the actual cost of maintaining the bureau is paid out of the funds of the department of health and represents about one-third of the total expense of the bureau, or about the value of birth and death certificates to the department.

The cost to the counties of collecting certificates of births and deaths was for the 12 months ended June 30, 1913, \$14,558.37, and the same remarks that apply to the State are also applicable to the counties. With a reorganization of the State health subdivision it should be possible to eliminate part of this expense to the county by doing away with the fees now paid to the county health officers acting as county registrars, and thus reducing the expense of collecting certificates almost one-half.

Appropriations.

The appropriations for the State department of health for the year 1913 were as follows:

For the control of preventable diseases:

| | |
|----------------------------|----------------|
| Epidemic..... | \$10,000 |
| Infectious diseases..... | 3,500 |
| Communicable diseases..... | 10,000 |
| Hydrophobia..... | 2,500 |
| Secretary's salary..... | 2,500 |
| Bureaus..... | 24,000 |
| | <hr/> \$52,500 |

For food and drugs:

| | |
|-----------------------|--------------|
| Food and drink..... | 2,500 |
| Food and drugs..... | 15,000 |
| Vinegar..... | 500 |
| Chemist's salary..... | 2,500 |
| | <hr/> 20,500 |

| | |
|-----------------------------------|--------------|
| Birth and death registration..... | 5,000 |
| General expenses..... | 2,000 |
| | <hr/> 80,000 |

The first appropriation in the above list, namely, \$10,000 for epidemics, is not available to the department unless an epidemic pre-

vails, and then only by direction of the governor of the State. This amount is, then, practically lost to the department under normal conditions and can not be used to defray the expenses of ordinary maintenance or of growth and development. The total appropriations are therefore practically decreased from \$80,000 to \$70,000.

It will also be noticed that there is no appropriation for the bureau of sanitary engineering, and it became necessary when this bureau was organized to allot \$8,000 from the bureaus' appropriation of \$24,000, thus cutting down the amount available to other bureaus, yet giving the bureau of sanitary engineering an amount wholly inadequate for its purpose.

By subtracting the \$10,000 epidemic fund, which is not available except in emergencies, from the amounts appropriated for the control of disease, there is left a total of \$42,500, which is only a little over twice as much as is appropriated in the name of food and drugs, namely, \$20,500. In other words, for every dollar appropriated for the eradication of preventable diseases, there is approximately 50 cents appropriated for enforcing the food and drugs act. The sum allowed for the latter purpose is not too much by any means, especially when it is kept in mind that the chemical laboratory and most of the inspectors of the department are paid from these appropriations. Nevertheless, it must not be forgotten that much of the work of the chemical laboratory is done for the division of food and drugs and that most of the inspectors' time is given to the work of that division. It must be conceded, therefore, that a disproportionate amount of money is allowed for the enforcement of the food and drugs act as compared with the amount allowed to other bureaus, especially the bureau of sanitary engineering, which receives only \$8,000 and is many times more important in the prevention of disease.

While realizing the great importance of the food and drugs act, its enforcement plays little part in the prevention of communicable diseases. Except for the authority it may have over the milk and shellfish problems, it is largely concerned with economic problems—i. e., the prevention of fraud. While the logical place for a division of food and drugs would seem to be the department of health, yet its operations should not be permitted to overshadow the greater public-health activities required of such a department.

The amount of money that a health organization should be entitled to in order to carry on its operations is always a disputed point. There is probably no health organization in the United States which has sufficient appropriations to carry on health work as it would like to. It is, however, gratifying to study such appropriations, past and present, which study shows that with a better appreciation of the importance of public health there is also an

increase in the appropriations allowed by the legislatures or other governing bodies, so that in some States the amount granted to the health department has been practically doubled within a legislative year.

In considering appropriations for public health and sanitation a distinction must be made between the powers and duties of State and municipal organizations, for the reason that the State's duties are largely supervisory, those of a prosecutor, advisory, educational, and investigative, while a municipality, in addition to these duties within its jurisdiction, is also concerned in construction and maintenance of hospitals and other installations. It is the duty of a municipality to furnish its people pure water, adequate disposal of sewage, isolation hospitals, dispensaries, garbage disposal systems, public baths and laundries, convenience stations, Pasteurizing plants, etc. A municipality will require, therefore, a larger amount of money to care for public health and sanitation than does a State, as it must pay for its own installations, while the State ordinarily incurs no expense.

It is difficult to draw conclusions from financial reports, for the reason that some health departments have supervision and control of medical practice acts, or the licensing of plumbers, factory inspection, etc., while in other States these duties devolve upon other bodies. Furthermore, some State health departments are concerned in the maintenance of hospitals; as, for instance, Pennsylvania, which has control of tuberculosis sanatoria. This, however, is the exception rather than the rule and when it does occur is covered by a special appropriation.

As far as public health problems are concerned, they are pretty much the same all over the world and only vary in degree of importance according as they are affected by local conditions.

In order to ascertain the amounts appropriated in different States for public-health purposes, and to make comparison of these amounts with the total revenues or expenditures and total population, the following table is presented.

Table showing the total revenues of certain States, and the amount expended by the State departments of health.

[The tables showing the "Total expenditures, appropriations, or revenues for 1 year" and "Expenses for State health department for 1 year" were obtained from the last available reports of State auditors, comptrollers, or treasurers, or from figures kindly furnished by the secretaries of State departments of health. Some inaccuracies may have occurred in gathering together these figures, but they should interfere but little with the purpose of the table.]

| State. | Population estimated as of July 1, 1911. | Total expenditures, appropriations, or revenues for 1 year. | | Expenses for State health department for 1 year. | Percentage of total expenditures for work of State health department. | Amount that would be received by a department at the rate of 2 per cent. |
|-------------------------------|--|---|--------------------------------|--|---|--|
| | | Amount. | Designation. | | | |
| Massachusetts... | 3,454,813 | \$15,760,351.07 | Expenses, 1912..... | \$167,600.00 | 0.0106 | \$315,207.02 |
| Washington..... | 1,218,330 | 7,812,627.56 |do..... | 19,800.00 | .0022 | 156,252.54 |
| Michigan..... | 2,867,794 | 7,445,519.60 | Expenses, 1911..... | 45,500.00 | .0061 | 148,910.38 |
| Minnesota..... | 2,099,451 | 19,312,793.96 | Receipts, 1912..... | 61,886.91 | .0032 | 386,275.86 |
| Rhode Island... | 558,108 | 3,184,761.09 | Expenses, 1912..... | 17,000.00 | .0053 | 63,695.22 |
| Connecticut..... | 1,140,003 | 6,423,287.91 | Appropriation, 1913... | 22,500.00 | .0035 | 128,465.74 |
| Oregon ¹ | 672,765 | 4,366,047.00 | Estimated appropriation, 1912. | 36,000.00 | .0082 | 87,320.00 |
| Virginia..... | 2,061,612 | 6,600,000.00 | Appropriation, 1913... | 35,000.00 | .0053 | 132,000.00 |
| Vermont..... | 357,463 | 2,000,000.00 | Appropriation, 1912... | 25,100.00 | .0125 | 40,000.00 |
| Kansas..... | 1,690,949 | 4,320,183.50 | Appropriation, 1914... | 30,550.00 | .007 | 86,403.66 |
| Indiana..... | 2,723,441 | 11,370,969.00 | Expenses, 1912..... | 83,000.00 | .007 | 227,419.38 |
| Maine..... | 748,233 | 5,366,785.75 |do..... | 18,250.00 | .0034 | 107,335.70 |
| New Jersey..... | 2,634,583 | 9,657,366.11 | Receipts, 1912..... | 115,425.00 | .012 | 193,147.32 |
| California ¹ | 2,486,757 | 8,598,502.00 | Estimated appropriation, 1912. | 119,600.00 | .013 | 171,970.00 |
| New York..... | 9,372,954 | 50,337,233.00 | Receipts, 1913..... | 198,510.49 | .0039 | 1,006,744.66 |
| Pennsylvania..... | 7,831,890 | 29,132,646.00 | Expenses, 1911..... | 525,084.50 | .018 | 586,652.80 |
| Maryland..... | 1,308,476 | 8,553,744.00 | Expenses, 1912..... | 70,000.00 | .008 | 171,074.88 |

¹ Appropriations are made for 2 years.

Departments of health are naturally divided into a central and a field organization. If all such departments were organized on the same basis, the expenses for maintaining the central organization would be constant and more or less the same in all States. The size and therefore the expense of the field organization would vary in the different States, depending on the number, nature, and distribution of the population, area, ease of transportation, nature and number of industries, and any condition peculiar to the State itself.

In quoting the above figures some effort has been made to eliminate those amounts which are not ordinarily considered as legitimate expenditures of State boards of health. A study of the table shows that the State of Pennsylvania is the only one giving to its department of health an appropriation which should insure the carrying on of all reasonable public health activities in a State of such size, population, and importance. This appropriation represents approximately 2 per cent of the total moneys available to the State.

The next appropriations in size are received by New Jersey, California, and Massachusetts, and represent approximately 1 per cent of the respective States' available moneys, and are manifestly too small to permit public health work to expand as it should. Mary-

land is receiving but eight-tenths per cent, an entirely inadequate amount.

Having studied the conditions in this latter State pretty thoroughly, it can be reasonably affirmed that if the health department should at the present time receive 2 per cent of the State's funds, namely, \$171,074.88, it could expand to that degree of efficiency desired by all those interested in the betterment of public health within the State. This amount would of course not enable the department to maintain institutions such as tuberculosis sanatoria, which require special appropriations, nor is it possible to foretell the amount that may be necessary for future public health activities.

While it is highly desirable and proper that county or district health officers should be directly responsible to the State department of health, it must not be assumed that the county should in consequence be relieved of all responsibility in health matters. It is under the same obligations to pay for health activities within its boundaries and to render assistance to the State's representatives as if those officials were really county officers.

As to appropriations for the purpose, the county is, in a smaller way, in the same position as the State, and not less than 2 per cent of its available funds should be set aside for public health work to be spent to the best advantage under the supervision of the State's representatives.

This figure, namely, 2 per cent of available funds, must not be taken as a criterion in estimating the amount the health department of a city should receive, as, for reasons given before, not less than 15 per cent should be allotted for such purposes.

Officers of the State Department of Health.

STATE BOARD OF HEALTH.

- Dr. William H. Welch, professor of pathology at Johns Hopkins University, president.
- Dr. Edgar A. Jones, pathologist to the Cambridge Hospital, member.
- Dr. Nathan R. Gorter, commissioner of health for the city of Baltimore, member.
- Mr. John E. Greiner, consulting engineer, Baltimore, member.
- Hon. Edgar Allen Poe, attorney general for the State of Maryland, member.
- Dr. William W. Ford, associate professor of hygiene at the Johns Hopkins University, member.
- Dr. John S. Fulton, professor of State medicine, University of Maryland, secretary.

EXECUTIVE OFFICE.

- Dr. John S. Fulton, secretary and executive officer.
- Mr. William Pinkney White, general counsel.
- Mr. Henry M. McCullough, special counsel.

BUREAU OF COMMUNICABLE DISEASES.

———, chief of bureau.

Dr. C. W. G. Rohrer, assistant and acting chief of bureau.

BUREAU OF VITAL STATISTICS.

Dr. Frederick V. Beitler, chief of bureau.

———, assistant chief of bureau.

BUREAU OF SANITARY ENGINEERING.

Mr. Robert Morse, A. B., B. S., chief of bureau.

Mr. Harry Hall, B. S., assistant chief of bureau.

BUREAU OF BACTERIOLOGY.

Dr. William Royal Stokes, chief of bureau.

Dr. H. W. Stoner, assistant chief of bureau.

BUREAU OF CHEMISTRY.

Dr. W. B. D. Penniman, chief of bureau.

Dr. W. W. Randall, assistant chief of bureau.

DIVISION OF FOOD AND DRUGS.

Dr. Charles Caspari, State food and drug commissioner.

CLERICAL DIVISION.

Mr. W. N. Kirkman, chief clerk.

HEALTH ACTIVITIES CARRIED ON BY OTHER AGENCIES.

Certain activities relating more or less directly to a department of health are carried on by State boards or commissions which are entirely distinct from the Department of Health of Maryland. They are as follows:

| Activities. | Board or commission. |
|---|---|
| Licensing of barbers..... | State board of barber examiners. |
| Control of dairies..... | State live-stock sanitary board. |
| Regulation of practice of dentistry..... | State board of dental examiners. |
| Inspection of factories..... | Bureau of statistics and information. |
| Control of insane and insane asylums..... | Lunacy commission. |
| Regulation of practice of medicine..... | State boards of medical examiners (two), one representing the Medical and Chirurgical Faculty of Medicine of the State of Maryland and one representing the Maryland State Homeopathic Medical Society. |
| Registration of nurses..... | State board of examiners of graduate nurses. |
| Regulation of practice of pharmacy..... | Commissioners of pharmacy. |
| Certification of competence of plumbers..... | State board of commissioners of practical plumbing. |
| Investigation of tuberculosis and control of sanatoria. | Tuberculosis commission. |
| Regulation of the practice of undertaking..... | State board of undertakers of Maryland (applies to Baltimore city only). |
| Dispensing and manufacture of vaccine..... | State vaccine agency. |
| Regulation of the practice of veterinary medicine.. | State veterinary medical board. |

RECOMMENDATIONS.

As a result of a careful study of public-health administration in Maryland continued over several months, certain definite conclusions have been reached and are made the basis of recommendations as follows:

1. That the State be divided into not less than 10 districts, each district to be composed of one or more counties, at the discretion of the State board of health.

2. That a physician trained in sanitary science be placed in each district, and that he be given an office and an adequate number of assistants, including inspectors, nurses, and a clerk.

3. That he hold office during efficiency and good behavior, and that he be given an adequate salary from the State, and that he be prohibited from practicing medicine or engaging in any private business that would interfere with his official duties; that he be allowed traveling expenses when traveling on account of official business; and that he be given, as he proves himself capable, a regular yearly increase in salary until he has reached a maximum which, in the judgment of the board of health, is sufficient; that he first receive a probationary appointment to determine his qualifications in the field; and that no one be appointed until he has passed an examination before the board or the secretary or has otherwise proved himself capable of filling the position.

4. That he be made responsible to the State department of health for the conditions in his district, and that he be given full power to enforce laws and regulations within his jurisdiction, and authority over all county, city, or town health officials.

5. That his powers and duties be well defined by law and include supervision of the work of all county, city, or town health officers; the enforcement of the law regarding the notification of cases of disease; inspection of dairies, canneries, and all places of business or manufacture within his jurisdiction; the inspection of county schools and school children; the investigation of nuisances and the abatement of the same; investigation of cases of sickness and institution of measures for the control of disease; the enforcement of the vaccination act; the keeping of complete records of transactions and forwarding all necessary reports to the State department of health; the delivery of public lectures throughout his district; the collection of samples for analysis; the enforcement of the laws relating to the registration of births and deaths; and the performance of all other duties that may be required of him by the State department of health.

6. That the field organization be mobile, so that a force of health officers or assistants can be concentrated in any part of the State or the city of Baltimore in case of epidemics.

7. That every incorporated town, and every town not incorporated of 1,000 people or over, be required to appoint, or the county commissioners be required to appoint, a health officer to represent that community, to receive a small salary, and to assist, as far as practicable, the district health officer in the performance of his duties; and that any person so appointed must have been previously approved by the State department of health.

8. That two or more adjacent towns be permitted to combine their available funds for health work and employ one health officer, who

shall be the health officer for each of the towns entering into such combination.

9. That provision be made by law for calling a conference of district health officers annually, or oftener, by the secretary of the State board of health, the expenses so incurred to be paid by the department of health.

10. That every county be required to set aside at least 2 per cent of its available funds each year to be devoted to the betterment of public health within the county, and that the expenditure of such funds be approved by the State board of health.

11. That the inspection force of the department be increased, and that this increase in numbers include at least one medical inspector.

12. That a comprehensive law be enacted making it compulsory on the part of all persons interested to have plans for proposed installations of water supplies, sewerage, and refuse-disposal systems approved by the State department of health; that the State department of health be empowered to require any changes or extensions in already existing installations that may be necessary to insure pure water supplies or proper sewage or refuse disposal systems; or to order the installation of new water-supply and sewerage or refuse disposal systems in the absence of same; and giving the State department of health the power to close or to prevent the use of water from any well, spring, etc., that, in its opinion, is dangerous to health; or to require the filling or draining of places where there is any accumulation of stagnant water, breeding mosquitoes or otherwise being a nuisance.

13. That the State be divided into at least four districts, in each of which shall be placed a representative of the State department, to be known as district engineer, and to come under the supervision of the bureau of sanitary engineering, and to be a graduate engineer or sanitary engineer.

14. That as the work of the bureau of sanitary engineering is increasing rapidly, there be added to its force of employees, in addition to the district engineers, more inspectors, draftsmen, and as necessary, clerks or stenographers.

15. That special attention be given to the heating, lighting, ventilation, water supply, toilet facilities, and sewage disposal in the public schools throughout the State.

16. It is recommended that sufficient money be appropriated to defray the expenses of the necessary reorganization as previously recommended, the amount so appropriated not to be less than \$50,000.

17. That a special appropriation be made for the bureau of sanitary engineering, or that the so-called bureaus' appropriation be increased to permit of a larger allotment to this bureau, the amount of appropriation so allowed not to be less than \$15,000.

18. That the appropriation of \$2,000 for general expenses, an amount which was allowed some years ago and which at present is manifestly inadequate, be increased to \$10,000 to cover the general expenses of the department, which has grown so extensively in recent years.

19. That a State-wide campaign be carried on against typhoid fever.

19½. That investigative studies be carried on in the State relative to pellagra, trachoma, hookworm, infantile morbidity and mortality, and malaria.

20. That the vaccine agency be abolished and its functions given to the department of health and the vaccination act be amended so as to make it stronger and modern.

21. That the method of handling nuisances be simplified.

22. That laws be enacted providing for the maintenance of sanitation of factories, canneries, stables, hotels, restaurants, etc.

23. That the maintenance of the sanitation of dairies and the control of milk supplies be taken out of the hands of the State live stock sanitary board and placed in the hands of the State department of health, and that more adequate laws and regulations be made to cover the subject.

24. That a law be enacted giving the State department of health power to require factories to take the necessary steps to prevent occupational diseases.

25. That the provisions of the model law for morbidity reports approved by the conference of State and Territorial health authorities with the Public-Health Service be adopted by the State of Maryland.

26. That a law be enacted requiring physicians to report death, recovery, or removal of all cases of communicable diseases, and that some "follow-up" system be used in the bureau of communicable diseases.

27. That the duty of statistical compilation and tabulation of morbidity reports be transferred from the bureau of communicable diseases to the bureau of vital statistics, this transfer to include also the work of statistical compilation and tabulation of occupational diseases.

28. That the special work of statistically compiling and tabulating reports of tuberculosis, at present performed by the tuberculosis clerk, be placed under the direct charge of the bureau of vital statistics.

29. That an approved form of birth certificate be devised to give more complete information.

30. That tabulating machines be installed.

31. That morbidity reports and mortality and birth certificates received by the city of Baltimore be transmitted daily by the city to the State department of health, either as originals, transcripts, or punched cards, and that the work of statistically compiling and

tabulating them be performed by the State department in conjunction with or for the city of Baltimore, as it now performs such work for all other parts of the State.

32. That a law be enacted requiring the reporting of all marriages and divorces to the State department of health.

33. That a system of school inspections be inaugurated and carried on throughout the State.

34. That the annual report be reduced in size as previously indicated and a financial report added.

35. That the present monthly bulletin for health officers be greatly simplified by omitting the detailed list of cases by name, etc.

36. That a popular bulletin be issued monthly and specially used for instructing children of the public schools.

37. That the State department of health aid the medical and chirurgical faculty by acquiring and loaning exhibits for its annual trip through the State.

38. That the books contained in the library be catalogued so that their contents may be available for reference.

39. That the secretary of the State department of health be granted a salary of not less than \$3,000 per year. This amount is stated not because it is deemed sufficient either for the position or for its present occupant, but because the constitution of the State of Maryland limits the salary of its officials to that amount except in a few specified instances.

40. That bureau chiefs be required to devote at least five working hours each day, except Saturday, and on Saturday at least three working hours, to official business.

41. That any bureau chief who devotes his entire time to the business of the department be granted a salary of not less than \$3,000 annually.

42. That seven working hours be considered as an official day's work.

Since the study of the department of health was begun, certain of the matters recommended in this report have already been acted upon by the State board. Bills have been prepared for introduction into the legislature relating to an increase in the secretary's salary; the maintenance of sanitation in all places where food products are manufactured or sold; the formation of an adequate district field force, and a comprehensive control of water supplies and sewerage systems. In addition, the board has decided on a standard working day of seven hours, a new birth certificate has been adopted, and tabulating machines have been installed, and the city of Baltimore is now sending its daily morbidity report sheets to the State department of health every seven days, and county spot maps are now made use of by the bureau of communicable diseases of the State department.

UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION IN BALTIMORE

A STUDY OF THE ORGANIZATION AND
ADMINISTRATION OF THE CITY HEALTH
DEPARTMENT

BY

CARROLL FOX

Surgeon, United States Public Health Service

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PUBLIC HEALTH ADMINISTRATION IN BALTIMORE.

A STUDY OF THE ORGANIZATION AND ADMINISTRATION OF THE CITY HEALTH DEPARTMENT.¹

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In connection with the investigation of sanitary organization and administration in Maryland, a study was made of the health department of the city of Baltimore. This study occupied about four months and comprised investigations into office methods as well as surveys of field operations with the inspectors of the department.

On account of the deficiencies of organization in the department it is thought best to report the findings according to activities rather than divisions carrying on those activities. The study was accordingly taken up under the following heads: The administrative office; the control of communicable diseases, including morbidity reports, control of tuberculosis and other diseases, and fumigations; food and dairy inspection; bacteriological work; registration of births and deaths; tenement-house inspection; medical inspection of school children; control of nuisances; inspection of plumbing; maritime quarantine; the secretaries' office; appropriations; field force; transportation of the department; and other public-health activities not under the control of the health department.

There are in the department five well organized subdivisions, as follows: A bureau of food and dairy inspection, a division of tuberculosis, a division of plumbing, a fumigation division, and a division of bacteriology. Of the heads of these but one, the chief of the bureau of food and dairy inspection, is authorized to assume responsibility. Accordingly, much of the responsibility and the details of administration fall upon the assistant commissioner of health, he being the immediate representative of the commissioner.

In addition to lack of organization, the department is handicapped by political considerations. These and other matters, including conclusions and recommendations, are subsequently presented in this report.

Health administration in Baltimore is conducted through a department of health which is a subdepartment of the department of public safety. The head of the department of public safety consists of a board of public safety composed of the president of the board of fire commissioners, who is president of the board of public safety, the commissioner of health, the inspector of buildings, the commissioner

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of street cleaning, and the president of the board of police commissioners. This board is for consultation or advice only, and has no power to control or direct the duties or the work of any subdepartment.

The health department, a subdepartment of the department of public safety, was formerly controlled by a board of health consisting of the mayor, the commissioner of health, and the assistant commissioner of health, but at the present time it is under the control of one man, the commissioner of health.

The Administrative Office.

Commissioner of health.—The commissioner of health is appointed by the mayor. He must be a physician of five years' experience and in active practice at the time of his appointment. The salary prescribed in the city charter is \$3,500 per annum.

The commissioner of health has employed in his office one stenographer, who receives \$720 a year.

The powers and duties of the commissioner of health under the charter and the code are as follows:

1. To cause all ordinances now in existence, or that may hereafter be enacted for the preservation of health, to be executed and faithfully observed.
2. To perform all other duties as are now or may hereafter be prescribed by ordinance.
3. To appoint two assistant commissioners of health, a medical examiner, and an assistant medical examiner, and a reasonable number of clerks and subordinates.
4. To appoint sanitary inspectors not to exceed 15 in number, two of whom may be physicians and one of whom must be a person skilled in matters of drainage and ventilation, and to prescribe the duties of each.
5. To appoint inspectors and analysts for the purpose of inspecting all places where food products, including milk, are handled, and to examine such food products.
6. To appoint a vaccine physician for each ward of the city to perform any duties required of him as vaccine physician and to discharge the duties of a sanitary inspector for his ward, at a salary of not more than \$900 per annum.
7. To give to the mayor or other city authorities such professional advice and information as they may require with a view to the preservation of the public health.
8. To investigate and ascertain as correctly as possible the causes of any malignant, contagious, or pestilential diseases that he may hear of.
9. To adopt measures to arrest the progress of such diseases.
10. To report in writing to the mayor every circumstance likely to endanger the health of the city.
11. To report to the mayor either orally or in writing once in every month.

Any person who knowingly obstructs or resists the commissioner of health or any of his subordinates in the execution of his powers or the discharge of his duties is liable to a fine of not exceeding \$100.

The commissioner of health as head of the subdepartment of health has the sole power of appointment and removal at pleasure of all deputies, assistants, clerks, and subordinate employees in his department, unless otherwise provided by the charter.

The commissioner of health is not required to devote all of his time to the work of the department, nor does the charter require that he shall be a man experienced in public-health matters. He holds his

position for four years by an appointment from the mayor. During the first six months of his service he may be relieved at the will of the mayor, but after that time can be removed only for cause, after charges have been preferred.

Unfortunately in the city of Baltimore party politics plays such an important part in the affairs of the department that progress is made with great difficulty, if at all.

Considering that the department of health is the oldest in the United States, having been organized in 1797, it has certainly not reached the stage of development which should be expected of it. This lack of progress is probably due to too much politics and an apathy on the part of citizens of the city regarding health administration.

The political obstacles which the commissioners have been continually required to meet in their efforts to improve conditions in the department should not have to be overcome by them alone, but they should have as their allies every public-spirited citizen of Baltimore.

Under ordinance the commissioner of health has the sole power of appointment and removal of department employees. As a matter of fact, he can not always exercise his power, and especially so when higher political authority insists on the right of nominating appointees. Unfortunately, when nominations are influenced by politics the matter of the fitness of nominees for the positions which they are intended to fill is likely to be overlooked.

Assistant commissioner of health.—There are two assistant commissioners of health, one of whom acts as quarantine officer for the port of Baltimore and is stationed at the quarantine station; the other is the immediate assistant to the commissioner of health, and is stationed in the administrative office of the health department. The duties of the former will be taken up elsewhere. The latter receives \$3,000 per year and has one clerk at \$900 and one stenographer at \$720 per year. His duties are as follows:

1. To be on duty in the health office every day except Sunday, unless otherwise engaged in the duties of his office.
2. To supervise the keeping of faithful records of all reports and other matters relating to the health department.
3. To act as commissioner of health in the absence of the commissioner.

By reason of his high professional qualifications and unusual administrative ability the assistant commissioner of health has been continued in office from year to year, although political considerations have time and again been urged as cause for his removal. His continued employment was one of the conditions on which the present commissioner of health is said to have accepted office.

On account of the lack of a sufficient number of bureau and division chiefs, the assistant commissioner of health, in addition to the duties

of his regular office, has to assume the duties of chief of the bureau of vital statistics and of the bureau of communicable diseases, and to attend to a host of other details which should devolve on responsible subordinates, leaving him sufficient time to give proper supervision to all of the bureaus of the department without too much attention to detail.

The Control of Communicable Diseases.

While most of the operations of any municipal health organization are primarily for the control of communicable diseases, special reference is here made to the operations relating to the notification of disease and the collection and disposition of morbidity reports, to the control of tuberculosis and other diseases, and to disinfection.

MORBIDITY REPORTS.

Reports of communicable diseases, as required by ordinance, are received and handled under the direction of the assistant commissioner of health by a clerk who is designated as the "communicable-disease clerk," who receives \$1,200 per annum. He also has charge of the registration of midwives, the licensing of boarding houses for infants, and certain other duties in connection with the office of the assistant commissioner.

His duties require his presence at the office on week days from 8.30 to 5 p. m. and on Sundays and holidays from 9 until 12 noon. On these days, in the absence of other employees, he also performs their duties if necessary.

Requirements of ordinances.—The ordinances under which the above-named duties are carried on are summarized as follows:

Every physician is required to report to the commissioner of health within 24 hours after his first visit, cases of smallpox, cholera, yellow fever, malignant diphtheria, measles, whooping cough, mumps, pseudo-membranous croup, scarlet fever, varioloid, typhoid fever, ophthalmia neonatorum, epidemic cerebrospinal meningitis, and poliomyelitis (infantile paralysis), giving the address and name of the patient.

All keepers of hotels and boarding houses and owners or agents of tenement houses or private dwellings are required to report to the commissioner of health, as soon as they are aware of the fact, every case of disease as mentioned above occurring on such premises, giving name of person, age, residence, or any other fact of importance.

The persons in charge of every public or private institution where persons lodge or abide temporarily or permanently are required to report in writing every case of smallpox, cholera, yellow fever, malignant diphtheria, scarlet fever, and varioloid occurring in such premises, giving the name of the person and the condition.

Officers or consignees of vessels within one-quarter of a mile of any dock, wharf, or building are required to report in writing to the commissioner of health all cases of diseases mentioned above occurring on the vessel, giving the location and name of vessel.

No midwife, institution, etc., not duly incorporated for the purpose may receive young children for the purpose of caring for them for remuneration without first securing a license from the commissioner of health.

Before this license is issued the application must be indorsed by four reputable citizens, and a record must be kept by the commissioner containing the full name

and address of each infant, date of birth, date of its reception, and, in case of change of address, the date and place of its removal.

Before issuing any such license the place must be visited by an agent of the health department, who examines as to its sanitary conditions, accommodations, etc., and makes such recommendations as the health department may use in granting or rejecting the application for license.

For violation there is a fine provided of \$25 and costs for each offense, one-half to be paid to the informer, or, upon failure to pay the fine, confinement in the city jail for a period of not less than 10 nor more than 30 days.

The provisions of this act shall in no way be regarded as applying to such persons or homes as may be recommended by the supervisors of city charities of Baltimore city.

Records and reports.—All notifiable diseases are reported by physicians on regular cards to the department of health and are handled by the communicable-disease clerk. He enters the name of the patient, age, address, by whom reported, to whom referred, and any necessary remarks, on a "Daily record of cases of infectious and contagious diseases reported," grouping the different diseases together. Copies of this record are sent to the State department of health weekly. In addition to this, similar information of reported cases is entered on filing cards, a separate style of card being used for each of the following-named diseases: Measles, mumps, whooping cough, varicella, tuberculosis, typhoid fever, and scarlet fever.

Cards reporting tuberculosis are sent by the communicable-disease clerk to the tuberculosis division, so that the cases can be investigated. The other cards are sorted according to wards and are turned over to the health wardens, who investigate the cases and report the results of their investigations on special forms.

In the case of typhoid fever, scarlet fever, measles, and diphtheria, special attention is paid to the milk supply. In the case of typhoid fever special attention is paid also to the water supply, while in the case of diphtheria, scarlet fever, measles, and chicken-pox, special note is made of the school which the patient attends.

Upon the receipt of the report of the health warden and the return of the notification card the information contained in the daily report is checked, showing that the health warden has made his report, and the cards are filed away, those from the physicians by wards and those from the health wardens by diseases. These files are kept for one or two years and then destroyed.

Spot maps are made use of in recording the location in the city of typhoid fever, scarlet fever, smallpox, and other diseases when epidemic or likely to become epidemic.

For the information of the statistician a weekly report is made of the number of cases of the different communicable diseases reported.

Other duties of the communicable-disease clerk.—In addition to the handling of morbidity reports, the communicable-disease clerk has charge of the registration of midwives, and in this respect he has the

same duties in the city as county registrars have in the counties. The blank forms used are the same and are issued by the State.

He also has charge of the registration of boarding houses for young children. This matter is covered by a State law applying to Baltimore city only. To establish such a place the person must make application, which application must contain the names of four people who recommend its establishment. When an application is received the proposed boarding house is investigated by a health warden as to its suitability for the purpose, and if he makes a favorable report, a permit on a special form is issued; the letter making application is filed away.

This clerk has as a duty also the keeping of records of reports of sore eyes of new-born children, made by midwives and physicians, and other clerical duties which arise in connection with the office of the assistant commissioner of health.

CONTROL OF TUBERCULOSIS.

The antituberculosis work is carried on through a well-organized division established in January, 1910, by the Department of Health, taking over the work that had been performed by the visiting nurses association and employing 15 nurses. Before that time there were two nurses employed by the health department, mainly for disinfecting after tuberculosis. Since the formation of the division there have been but two nurses added, and the number is yet entirely too small adequately to handle the situation.

Its personnel and their respective salaries at present are as follows:

| | |
|--|--------|
| 1 superintendent of tuberculosis dispensaries..... | \$600 |
| 1 superintendent of the division (on leave without pay)..... | |
| 1 acting superintendent of the division..... | 1,200 |
| 16 visiting nurses, at \$900..... | 14,400 |
| 1 clerk..... | 720 |
| | <hr/> |
| | 17,520 |

Duties of the division.—The duties of this division are to make diagnoses in patients supposed to be suffering with tuberculosis; to furnish free treatment to the indigent cases; to visit tuberculous patients at their residences; to give the necessary instruction to prevent the spread of the disease and improve the methods of living in the family; to furnish nursing care and antituberculosis packages free of charge; to arrange for fumigation in cases of tuberculosis; to inspect after the process of fumigation is completed; and to arrange for the destruction or disinfection of infected articles.

Requirements of ordinances.—The ordinances relating to tuberculosis are summarized as follows:

The commissioner of health is required:

To register the name, address, sex, and age of every person suffering from pulmonary tuberculosis, and physicians are requested to forward such information for the report

of these cases on the same card as is used for reporting other communicable diseases. This information is solely for the use of the commissioner of health, and he is not to assume any sanitary surveillance unless the patient resides in a tenement house or hotel, or unless the attending physician requests that an inspection of the premises be made. No inspection may be made even when the patient resides in a tenement house, boarding house, or hotel if the physician in attendance is willing to deliver circulars of information designed to prevent the spread of the disease.

Under the charter the mayor and city council of Baltimore are authorized to appropriate such moneys as they deem necessary to the hospital for consumptives of Maryland of Baltimore City (Eudowood). This sum can not exceed \$4,000 per annum.

It is prohibited by ordinance to expectorate or spit in, on, or upon any sidewalk, footpath, avenue, public square, public building, street or railway car, or other public conveyance, depot, or station of any common carrier, theater, store, factory, or any building used in common by the public, hall or office of any hotel or lodging house used in common by guests.

Notices forbidding spitting must be conspicuously displayed.

Places contemplated above must provide proper receptacles for expectoration, which must be cleaned and disinfected at least once every 24 hours.

For violation of the ordinance relative to expectoration there is provided a fine of not less than \$1 nor more than \$5 for the first offense and not less than \$5 nor more than \$10 for each subsequent offense.

Dispensaries.—There are three free tuberculosis dispensaries operated by the city and located in the poorer sections of the town, as follows: 1220 McCulloh Street, open after 3 p. m. on Mondays and Thursdays; 602 South Bond Street, open after 3 p. m. on Wednesdays and Fridays; 1418 Light Street, open after 3 p. m. on Tuesdays and after 10 p. m. on Saturdays. In addition to these dispensaries there are two other free tuberculosis dispensaries in the city, one at the University of Maryland and one, the Phipps Tuberculosis Dispensary, at the Johns Hopkins Hospital.

The superintendent of tuberculosis dispensaries is a physician and is required to give to the city only the time necessary to be present during the hours at which the city dispensaries are open, i. e., two to three hours a day. He is not required to treat any case at its residence. When it is necessary to see a case at other than the dispensary, the duty devolves upon one of the physicians employed by the board of supervisors of city charities. If they are called upon during the hours at which they are on duty at the other free dispensaries of the city, the case may be seen promptly; if not, it must wait until the next day.

Hospitals.—The Bay View Hospital, which is the city almshouse, has a division known as the municipal tuberculosis hospital, containing 184 beds, of which 105 are for white males, 36 are for white females, 28 for colored males, and 17 for colored females. To this hospital are sent mainly cases of advanced tuberculosis, and it is necessary to certify that they are paupers before they can be admitted.

There is also a general hospital in connection with the institution, which likewise will only admit patients who are paupers. Such a provision certainly detracts from the usefulness of any charitable

institution, as there is a great distinction between poverty and pauperism. A person who is poor merely by reason of circumstances over which he has no control and who may be desirous of bettering his position when his health will permit has too much pride to be placed in an institution as a pauper. The free city beds in the other hospitals taking all patients except tuberculous, are open to the poor as well as the pauper, and the free city beds in the other sanatoria for tuberculosis.

The Bay View Hospital is in charge of the board of supervisors of city charities, and before any patient can be admitted, authority must be obtained from the proper officer of this municipal organization. His office hours are between 9 a. m. and 3 p. m., and on Saturdays from 9. a. m. until 12 noon, and the office is not open on Sundays or holidays. Except during these office hours it is impossible to have patients admitted.

In the Eudowood Sanatorium, which is located outside of the city, the city maintains 10 beds. There are, however, in this sanatorium 75 beds occupied by city patients, a number of whom pay various amounts up to \$10 per week.

In the State tuberculosis sanatorium, located near Sabillasville, there are 225 beds occupied by city patients. Some of these beds are free, while for others the patients pay as high as \$10 per week.

There is also a Jewish home for consumptives, to which indigent patients may be sent.

Visiting nurses.—Women employed in this capacity are all registered nurses. Their hours of duty are between 8.30 a. m. and 4 o'clock p. m. In addition to this they perform a certain amount of clerical work at home in making out their reports, which consumes about an hour, and frequently give much overtime in their dispensary or district work.

There are eight offices rented by the city to which the nurses go at noon where they eat lunch, interview patients, issue supplies to patients, and receive instructions by telephone from the supervising nurse.

Tuberculosis occurring in the city is reported by physicians by card to the city health department. These cards are immediately referred to the superintendent of visiting nurses, and the necessary information is entered on the visiting list of the nurse within whose district the case has occurred. The report card is then checked and returned to the vital statistics division to be registered and worked up as statistical data. When this is accomplished, it is returned to the tuberculosis division and filed. Cases of tuberculosis are frequently brought to the notice of the division by the charitable institutions of the city. Many cases are found during the visits of the nurses to different houses containing patients known

to have tuberculosis. In fact, a study of the records of the division shows that, taking an average of the reported cases for the first three and one-half years—January 1, 1910, to July 1, 1913—there was one case only reported for each three doctors per year, while there were 26 cases reported by each nurse per year. In other words, the 16 nurses reported about as many cases as the 1,296 general practitioners.

Probably most of the cases of tuberculosis are brought to the attention of the division by the tuberculosis dispensaries.

It is the aim of the division not to have a person suspected of having tuberculosis, as reported by a layman, referred direct to a dispensary until an investigation has been made by a visiting nurse, who decides from the history and symptoms whether tuberculosis probably exists. If so, the patient is referred to a tuberculosis dispensary or to the family physician. If probably some other condition, it is referred to another dispensary, where the proper treatment may be obtained free of charge.

It has been learned by experience that where persons with suspected tuberculosis are referred direct to a tuberculosis dispensary and if it then be found that they actually have tuberculosis, the great majority of them will not return to the dispensary or take the trouble to go to another dispensary to receive the proper treatment, but will rather be inclined to hide the fact that they are suffering with the disease. It has also been learned by experience that when the nurse has an opportunity to visit the patients before they go to a dispensary she becomes familiar with them and their families, and it is easier for her to secure their confidence.

The visiting nurses do not make physical examinations. These are left entirely to the physician in charge. If a case is under the care of a practicing physician the nurse does not visit the patient unless with the consent of that physician. She confines her attention to tuberculosis patients only, other persons in need of assistance being referred to the proper authorities. There is of course little actual nursing required except in instances where the patient is bedridden and no hospital accommodations are available for the time being. The important work of these visiting nurses consists in instructing the patients in the right way to live to prevent the spread of the disease and in efforts toward improving the hygienic condition of the household.

Antituberculosis packages are issued free of charge either at the dispensary or by one of the nurses at her visit. These packages are furnished by the State department of health. All nursing supplies and medicines required are furnished by the city department of health. In exceptional cases, milk and eggs are furnished by the federated charities, the St. Vincent de Paul Society, or Hebrew Benevolent Society upon the request of the health department. More fre-

quently, however, if assistance is necessary, it is the aim to supply the necessary food for the entire family in worthy cases, rather than food intended only for the patient. This is done, however, only where there is no hospital accommodation for the patient.

The visiting nurses are allowed necessary car fare. The supervising nurse, however, is limited to an expenditure of 10 cents a day for this purpose. While women are not so likely to be involved in petty politics and while their moral sense is of a higher standard than that of men, nevertheless, their work, as in the case of inspectors of the department, must be followed up carefully to see that they are performing it properly. This should be one of the duties of the supervising nurse, and would require an amount of travel which would incur an expense much in excess of 10 cents a day. That supervision is necessary has been clearly indicated, an investigation of the work of one of the nurses showing that she had been neglecting her work and falsifying her reports. She was summarily dismissed.

Before a nurse is employed in the division she is required to fill out an application blank containing her name, etc., and information as to the training school she attended, the subjects taught, and her experience. No examination is held before appointment. The women employed in this kind of work should not only be graduates of a general hospital, but should have some experience in social work. The duties performed require intelligence and a high degree of capability and the more or less rare faculty of gaining the confidence of people in all walks of life. Of the cases followed up by the nurses 11 per cent only had been beneficiaries of any charitable organization.

There are at present over 3,400 names of patients on the visiting list, or an increase of about 1,783 since January 1, 1910, and with the number of visiting nurses employed it is manifestly a physical impossibility to visit the patients as often as necessary, and undoubtedly the force of visiting nurses should be at least doubled, and at least two assistants or supervisors given to the superintendent of nurses.

Reports and records.—In order that the charitable organizations may not be imposed upon, the federated charities have instituted a confidential exchange of information, to which such organizations taking care of persons who are destitute may report the fact. The federated charities then informs all other like organizations. This tends to prevent imposition or duplication of work.

The nurses are required to submit a daily report which includes the name and address of the patients visited and the time such visit was made, also a monthly report which shows the number and disposition of patients by day, week, and month.

From the above reports there is a monthly summary made on a filing card by each nurse, showing the total amount of work done and the disposition of her patients.

Where milk and eggs are required for the patient, a regular report is made out for the files of the division.

When a patient is first seen, two cards are always made out, one containing certain data for the information of the division and the other a complete history of the case. When a case has been discharged on account of death or removal or mistaken diagnosis, the fact is noted on both cards and they are then removed to other files. The progress of the case from time to time is entered on the history cards. So far no case has been discharged on account of recovery.

As soon as a diagnosis of tuberculosis has been made by a physician, a third card is made out and sent to the State board of health in order that the case may be registered as required by the State law.

Where the laboratory reports that tubercle bacilli have been found in a sample of sputum submitted for examination, a telephone message or a postal card, if the physician can not be reached by telephone, is sent to the attending physician asking him if he wishes a visiting nurse to see the patient.

Two cards are also kept relating to the fumigation after death or removal of the patient. One of these cards is filed in the tuberculosis division and the other in that division which has charge of fumigation. Where it is necessary to have clothing, bedding, etc., destroyed or sterilized, there is a special form of request to be made out by the person interested, waiving all claim upon the city for injury to same.

A card has been devised to secure information relative to the domestic occupations of the patient. This is now in use.

A special record is kept on a card of school children having tuberculosis.

To secure admission of a patient to Bay View Hospital, two forms of application are used, one when the application is made by the physician at the dispensary and one when the application is made by a nurse from the patient's home. These applications are sent to the chief clerk of the board of supervisors of city charities. Still another form is used requesting permission to admit a patient to the Maryland State Tuberculosis Sanatorium.

Monthly reports are made out, one having special reference to the places inspected for fumigation or cleaning; one showing the work for the month of the visiting nurses, and one, just being put into use, showing the relative amount of work performed by each nurse.

A circular is issued to households in which tuberculosis is present explaining the need for disinfection and cleaning of rooms, bedding, etc., after the removal of the patient.

At the dispensary a complete history of the patient is recorded on a special form, to which are added the results of physical examination and changes noted at each visit. In addition to this, necessary

information is entered on a card and filed. Each patient is given a small card with name and number to identify him at the next visit.

The nurses are required to make out monthly an expense account of their traveling expenses for each day of the month. This is similar to the expense account that is made out in the bureau of food and dairy inspection, except that the supervising nurse enters the expenses of all her nurses on one sheet and swears to it herself, whereas in the case of the bureau of food and dairy inspection each individual account is sworn to by the inspector whose expenses it represents. These are submitted to the comptroller and the check for the total amount sent to the responsible person, who then pays the subordinates.

The details of submitting these expense vouchers and reimbursements should be taken over by the one who is responsible for the payment of bills in the department.

The clerk employed in this division is unfortunately not a stenographer nor a typewriter, and most of the correspondence has to be written in longhand before it is typewritten, which means much extra and unnecessary work for the supervising nurse. The clerk is also required to be present at the dispensary every afternoon and Saturday morning to take the history of all applicants for treatment.

Open-air schools.—There is at present in the city an open-air school for one class. This consists of a tent pitched in the playground of one of the public schools. During my visit to this school the pupils were receiving their instruction outside of the tent and with no protection from the sun, the glare of which was undoubtedly causing annoyance. Pupils requiring open-air instruction need plenty of fresh air rather than sunlight, and in this case they would receive the maximum amount of benefit from the fresh air if they were given their instruction under the shelter of the tent, the sides of the tent being kept raised at all times except during inclement weather. The roof of this tent is too low, however, and it should be raised. Another objection to this particular location is that, being at the street level, the atmosphere around the children must be laden with dust.

The pupils of this class are given their lunch free of charge in the school, where there is taught domestic science to other pupils of the school. They are also permitted to rest a certain amount each day. A record is kept of the physical condition of each child in the class. While such an open-air class is intended primarily for children suffering from tuberculosis not in the active stage, other children with anemia, underdevelopment, etc., are also admitted, which is a very wise provision.

There are two modern school buildings which have been so designed that the top floor is for open-air instruction, and contains, besides the

classrooms, a diet kitchen and necessary toilets and lavatories. For some unknown reason, however, the school board has not seen fit to put them to the use for which they were intended, and they are now being used as ordinary schoolrooms. In fact, it was only after great effort that the open-air class at the other school was commenced, and much was accomplished through the efforts of public-spirited citizens.

Attitude of physicians.—It seems strange that some of the physicians of the city resent the efforts of the visiting nurses to assist their patients, considering it an unwarranted interference with their private practice. Their reasons are purely of a mercenary nature, and fortunately but few of them take such an attitude. These claim that it is to their interest to have the patient remain in the city and that the nurse should not recommend treatment at a sanitarium. They also seem to be unwilling to inform the patient or the family that tuberculosis is the cause of the patient's illness, this being not only unfair to the patient but to contacts as well, as it precludes the possibility of taking necessary means to prevent the spread of the disease.

Tabulation of statistics relative to the work of the tuberculosis division.

| | 1909 | 1910 | 1911 | 1912 | 1913 |
|---|------------------|------------------|------------------|------------------|------------------|
| Patients under care Jan. 1..... | | 1,617 | 2,416 | 2,772 | 3,107 |
| Patients received during the year..... | | 2,634 | 1,903 | 1,971 | 1,878 |
| Total number of patients cared for during the year..... | | 4,251 | 4,319 | 4,743 | 4,985 |
| Total number of visits made during year..... | | 61,326 | 69,311 | 81,028 | 79,289 |
| Deaths from pulmonary tuberculosis in Baltimore..... | 1,273 | 1,234 | 1,165 | 1,189 | 1,129 |
| Under supervision before death..... | | 783 | 802 | 859 | 995 |
| Per cent..... | | 63½ | 68½ | 72½ | 75½ |
| Cases registered with the State board of health..... | 919 | 3,202 | 1,712 | 2,215 | 2,204 |
| Patients sent to dispensaries..... | | 2,903 | 1,917 | 3,082 | 3,375 |
| Patients sent to municipal tuberculosis hospital..... | | 339 | 291 | 310 | 298 |
| Patients sent to State sanitarium..... | | 107 | 109 | 180 | 295 |
| Patients sent to Eudowood..... | | 79 | 109 | 123 | 116 |
| Patients sent to Jewish Home for Consumptives..... | | 25 | 33 | 53 | 61 |
| Number of cases reported by doctors and nurses: | | | | | |
| 1,160 doctors..... | | 432 | | | |
| 14 nurses..... | | 706 | | | |
| 1,246 doctors..... | | | 349 | | |
| 14 nurses..... | | | 358 | | |
| 1,254 doctors..... | | | | 382 | |
| 16 nurses..... | | | | 251 | |
| 1,296 doctors..... | | | | | 328 |
| 16 nurses..... | | | | | 214 |
| As the result of nurses' instructions following fumigation after death: | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> |
| Percentage of houses cleaned..... | | 69 | 77 | 74 | 79 |
| Bedding, etc., destroyed..... | | 41 | 38 | 38 | 39 |
| Bedding, etc., sterilized..... | | | | 22 | 36 |
| As the result of nurses' instructions following fumigation after removal: | | | | | |
| Percentage of houses cleaned..... | | 58 | 64 | 66 | 73 |
| Bedding, etc., destroyed..... | | 7 | 5 | 6 | 7 |
| Bedding, etc., sterilized..... | | | | 7 | 21 |

CONTROL OF DISEASES OTHER THAN TUBERCULOSIS.

As in many other things, the details of the work of combating communicable diseases as they occur in the city falls upon the assistant commissioner of health. In this work he is assisted by the chief

of the division of fumigation and the communicable-disease clerk, and has as field force 24 health wardens designated officially as vaccine physicians to which detailed reference is made on page 1554.

Requirements of ordinances.—The diseases to be treated in the municipal hospital for infectious diseases are diphtheria, scarlet fever, measles, and chicken-pox.

No person without a permit from the commissioner of health may transport from one place to another a person sick of a contagious disease, expose an individual sick of such disease, or a body dead of such disease, or needlessly expose himself or contribute to the spread of disease. All bodies dead of any contagious disease above mentioned must be buried within 24 hours after death unless an extension of time be granted by the commissioner of health.

With the authority of the mayor, the commissioner of health may require all persons sick from a contagious or infectious disease to be removed from a house and may place them in such building as he deems best, this to be done at the expense of the city; and for the purpose of properly treating the building from which they were removed, the commissioner of health, with the approval of the mayor, may place any house or district in quarantine, fencing it in and guarding it by sentinels, and may furnish also, with the approval of the mayor, subsistence and clothing, if necessary, during the period of quarantine, the expense to be borne by the city.

With the approval of the mayor the commissioner of health may erect temporary structures or rent such places as are necessary to be used as hospitals for isolating and treating the sick, and may cause such sick to be removed thereto unless the condition is such that they will not bear such removal, in which case the dwelling must be considered as a hospital and subject to necessary restrictive regulations.

When such diseases are found to exist the commissioner of health is required to take steps to prevent the spread of the infection and properly placard the house.

The commissioner of health must require and enforce the vaccination of all persons residing in the city not already vaccinated, and the revaccination of any person in the infected district whenever in his opinion it is necessary.

Parents and guardians are required to have their children and wards vaccinated before they reach the age of one year, and revaccinated whenever the commissioner of health, after five years from last vaccination, requires it.

The commissioner of health may appoint extra vaccine physicians when he deems it expedient to properly vaccinate the citizens of Baltimore; the advice and consent of the mayor is necessary. All physicians or dispensaries entitled to receive vaccine free of charge from the mayor and city council are required to keep on hand a full supply. Where vaccination fails it is the duty of the vaccine physicians to repeat the operation until they are satisfied that the subject will not receive vaccine infection.

No person may inoculate with the virus of smallpox under a penalty of \$20 for each offense.

For noncompliance with any provision of the law relative to communicable diseases there is a fine provided of not less than \$1 nor more than \$100, except that the fine for the refusal to vaccinate shall not exceed \$10.

Smallpox and vaccination.—During the past winter there was a considerable prevalence of smallpox in the city, with two deaths.

This disease, while mostly confined to the colored people, also attacked the whites, and seemed to be spread pretty generally over the city. The great majority attacked were unvaccinated. The outbreak called for widespread vaccination, but there was some trouble under the ordinance in compelling persons to expose their arm for

inspection to determine whether they had been previously vaccinated, and in fact the court ruled that the health department would have to accept the certificate of the physician. An effort was made to have the council adopt an ordinance requiring that everybody be compelled to expose their vaccination mark when requested by the vaccine physician. In the council this was amended so that a certificate of any reputable physician would be accepted by the health department. This, of course, is useless because it is not so much the fact that a person was vaccinated as it is whether the vaccination was successful; a person unsuccessfully vaccinated is just as dangerous to himself and to the community as is one not vaccinated at all, unless he has been vaccinated a sufficient number of times to prove that he is insusceptible to the virus. This ordinance did not pass, however, but the work was carried on notwithstanding by the health wardens and emergency vaccine physicians, and in all only 5,000 people were vaccinated, most of whom had never been vaccinated before.

Cases of smallpox are taken to the hospital at the quarantine station, contacts are vaccinated, and the house is fumigated and placarded.

Typhoid fever, etc.—When a case of communicable disease is reported to the health department, the report is turned over to the health warden, who makes an investigation with special reference to the milk supply in cases of scarlet fever and diphtheria, the milk and water supply in cases of typhoid fever, and the school attended by the patient in diseases affecting children.

The details of handling these diseases are given in the tabulation which follows:

| Disease. | Preliminary investigation by health department. | Placard-ing. | Period of quarantine for patient. | Period of quarantine for contact. | Exclusion from school—Contacts. | Breadwinners. |
|------------------------------------|---|--------------|-----------------------------------|-----------------------------------|---|---|
| Smallpox..... | Yes; for diagnosis..... | Yes.... | End of sealing..... | 13 days.. | No exclusion from school if child is vaccinated. | If vaccinated before and responsible; paroled unvaccinated and irresponsible; detention. Do. |
| Scarlet fever..... | No..... | Yes.... | End of desquamation..... | 7 days... | 7 days..... | Do. |
| Diphtheria..... | No..... | Yes.... | After 1 negative culture..... | 1 negative culture. | After house fumigation or after 1 negative culture. | No detention. |
| Measles..... | No..... | No.... | Optional to physicians..... | None.... | Duration of illness except when contact has had measles. | Do. |
| Whooping cough..... | No..... | No.... | do..... | do..... | None..... | Do. |
| Varicella..... | Yes; in selected cases for diagnosis. | No.... | do..... | do..... | Until all are well except when contact has had chicken-pox; then there is no exclusion. | Do. |
| Mumps..... | No..... | No.... | do..... | do..... | None..... | Do. |
| Typhoid fever..... | No..... | No.... | do..... | do..... | No..... | Do. |
| Epidemic cerebrospinal meningitis. | No..... | No.... | do..... | do..... | No..... | Do. |
| Anterior poliomyelitis..... | No..... | No.... | do..... | do..... | No..... | Do. |
| Pediculosis..... | No; in schools only..... | No.... | None..... | do..... | No..... | Do. |
| Scabies..... | Yes; schools only..... | No.... | do..... | do..... | No..... | Do. |
| Ophthalmia neonatorum..... | Yes..... | No.... | do..... | do..... | No..... | Do. |
| Tuberculosis..... | By nurses ¹ | No.... | do..... | do..... | No..... | Do. |

¹ Physicians in some instances object to nurses visiting the cases.

| Disease. | Closing of business. | Terminal disinfection. | Notifiable. | Hospitalization of patient. | Special treatment for— | | Special investigation by health wardens. | Detention of contacts. | Visit of nurses. | Principal of school notified. |
|--|--|------------------------|-------------|---|-------------------------------|----------------------|--|------------------------|------------------|-------------------------------|
| | | | | | Patients. | Contacts. | | | | |
| Smallpox..... | No..... | Yes..... | Yes..... | Compulsory... | Hospital..... | Vaccination... | ..... | Yes; if unvaccinated. | No..... | Yes. |
| Scarlet fever..... | No, except for milk ¹ | Yes..... | Yes..... | Noncompulsory, ².....do..... |do..... | No..... | Yes..... | No..... | No..... | Yes. |
| Diphtheria..... |do. ¹ | Yes..... | Yes..... |do..... | Hospital and anti-free toxin. | Antitoxin..... | Yes..... | No..... | No..... | Yes. |
| Measles..... |do. ¹ | No..... | Yes..... | No..... | No..... | No..... | Yes..... | No..... | No..... | Yes. |
| Whooping cough..... |do. ¹ | No..... | Yes..... | No..... | No..... | No..... | Yes..... | No..... | No..... | Yes. |
| Varicella..... |do. ¹ | No..... | Yes..... | No..... | No..... | No..... | Yes..... | No..... | No..... | Yes. |
| Mumps..... |do. ¹ | No..... | Yes..... | No..... | No..... | No..... | Yes..... | No..... | No..... | Yes. |
| Typhoid fever..... |do. ¹ | On request | Yes..... | No..... | No..... | Antityphoid vaccine. | Yes..... | No..... | No..... | Yes. |
| Epidemic cerebrospinal meningitis..... |do. ¹ | Yes..... | Yes..... | No..... | No..... | No..... | Yes..... | No..... | No..... | Yes. |
| Anterior poliomyelitis..... |do. ¹ | No..... | Yes..... | No..... | No..... | No..... | Yes..... | No..... | No..... | Yes. |
| Pediculosis..... | No..... | No..... | No..... | No..... | No..... | No..... | None..... | No..... | No..... | Yes. |
| Scabies..... | No..... | No..... | No..... | No..... | No..... | No..... | None..... | No..... | No..... | Yes. |
| Ophthalmia neonatorum..... | No..... | No..... | Yes..... | No..... | Hospital..... | No..... | None..... | No..... | No..... | Yes. |
| Tuberculosis..... | No ³ | Yes..... | Yes..... | Voluntary..... |do..... | No..... | None..... | No..... | In most cases. | Yes. |

¹ Only in such instances where there is marked exposure and the patient can not be taken to the hospital.

² Hospital conditions not yet sufficient.

³ Except where the tuberculous patient is waiting on the store and selling foodstuffs consumed raw and the patient will not go to the hospital.

Hospitalization of communicable diseases.—There is accommodation at Sydenham Hospital, the municipal hospital for acute communicable diseases, for 36 patients. In addition, smallpox cases are taken to the quarantine station, where there is accommodation for 80 patients, and there are 186 beds for tuberculosis at the Bay View Hospital; there is then a total of 312 beds to accommodate the communicable diseases, and this figure does not take into consideration the city beds at the Eudowood Sanatorium and the State sanatorium for tuberculosis.

The ordinance specifies that there shall be taken to Sydenham Hospital cases of diphtheria, scarlet fever, varicella, and measles, and 36 beds are not a sufficient number to isolate these diseases occurring in a city the size of Baltimore.

On a basis of one bed to 1,000 population the communicable-disease hospital in Baltimore should have at least 500 beds, which would not be too large, especially if it were utilized to take cases of advanced tuberculosis.

The recent legislature has authorized a bond issue of \$750,000 to erect a communicable-disease hospital. This amount should be sufficient to build and equip a hospital of 500 beds. The land on which the present hospital is built is located outside of the city limits and is owned by the city. There is ample ground to accommodate a large hospital. It has the disadvantage, however, of being situated outside of the city limits, which makes the transportation of patients difficult and annoying both to the health department and to the patients. A State "local law" will not permit the building of a communicable-disease hospital within the city limits, and this law has been upheld by the courts and apparently by public opinion.

The average citizen is not sufficiently familiar with the causes and methods of transmission of diseases. Consequently he looks upon a communicable-disease hospital as a "pesthouse," and believes living in its vicinity will cause sickness and death. Yet the same citizen will sit complacently by and permit scarlet fever, diphtheria, and typhoid fever to be treated in houses of his neighbors. The only rational argument in favor of the location of the hospital away from the centers of population is the fact that the city already owns a good piece of property suitable for the purpose in such location.

The management of the present hospital is under the city department of health, and the management of the proposed hospital should also be so placed, at least in so far as acute communicable diseases are concerned. The primary reason for the existence of a department of health is to combat the communicable or preventable diseases, and it should certainly have control of the hospitals for isolation, one of the most important features connected with the eradication of all diseases. Such a hospital should certainly not be under the super-

vision of the city charties, because it is not a charitable institution, and should not be associated in any way with the care of paupers. If its management is distinct from the health department, which is so vitally concerned with the admission, detention and discharge of patients, there will be a continual conflict of authority.

FUMIGATION ON ACCOUNT OF COMMUNICABLE DISEASES.

The division having charge of fumigation has been in existence a number of years, and at present its personnel and their respective salaries are as follows:

| | |
|-----------------------------------|---------|
| 1 superintendent of division..... | \$1,200 |
| 5 fumigators, at \$800..... | 4,000 |
| 1 chauffeur..... | 720 |
| 4 wagon drivers, at \$720..... | 2,880 |
| 1 morgue keeper and engineer..... | 1,200 |
| | <hr/> |
| | 10,000 |

There are at present temporarily employed, four guards, at 20 cents an hour, on account of the prevalence of smallpox in the city.

Duties of the division.—As its name implies, the division is especially engaged in disinfection after certain of the communicable diseases, but in addition it is concerned with the burial of the pauper dead; the oiling or eradication of mosquito-breeding places; the supervision of the morgue, and the special work of handling smallpox cases within the city.

Requirements of ordinances.—A number of ordinances devolve upon the division for enforcement as follows:

It is unlawful to convey any person suffering from diphtheria, smallpox, scarlet fever, or other contagious disease, to or from any point in the city of Baltimore, or any dead body known to have died of smallpox or other contagious disease in any public conveyance under penalty of having the conveyance taken, disinfected, and quarantined for 30 days, unless such conveyance is used for that purpose only.

Public conveyances can not be used for carrying persons suffering with, or who have died from smallpox, scarlet fever, diphtheria, or any other infectious disease, from any dwelling to the cemetery, unless they have the conveyance properly disinfected after it has been used for this purpose.

Where a person has died or has been removed from the premises who has suffered with smallpox, scarlet fever, diphtheria, or other contagious disease and without proper disinfection by the occupant before vacation, it is made the duty of the owner of the property to have the premises properly fumigated before permitting other tenants to come therein.

No person may bring to any dock, wharf, or building, or within 1,000 feet thereof, or unload or store any skins, fish, rags, bones, hides, or any similar article brought from an infected place, without a permit from the commissioner of health; nor may any person sell or exchange any straw, bedding, or clothing that has been exposed to a contagious disease or is liable to communicate such disease, without previous cleansing or disinfection and a written permit from the commissioner of health.

The commissioner of health has the power to detain any package, clothing, bedding, or goods which may be infected and which may be dangerous to the public health, by first obtaining a warrant from the nearest magistrate.

The morgue is under the general charge of the commissioner of health who has the power to make regulations for its government and for the care and delivery of the bodies and effects of deceased persons.

It is used for the reception and preservation for identification of bodies of unknown persons dying within the city limits, or such other bodies as may be placed therein by the direction of the coroner.

Where bodies are decomposed so as to be unrecognizable or have died of contagious diseases, they are not placed in the morgue.

Bodies are required to remain in the morgue for at least one day, or for such a length of time as the commissioner of health may deem proper.

A room must be provided for the care of clothing and effects of deceased persons, which effects are required to be numbered and kept for 12 months, after which they may be disposed of by the coroner.

The commissioner of health appoints a superintendent, who must be a practical undertaker. This superintendent, before he takes over his duties, must give a bond of \$1,000.

There is a potter's field provided for in the city of Baltimore under the control and direction of the commissioner of health, who is authorized, with the consent of the mayor, to establish regulations for its proper maintenance.

The ordinance specifies that all graves in any cemetery must be at least 4 feet 6 inches deep, and that the proper person shall see that the gates are closed or locked, and there are fines provided for failure to comply.

The commissioner of health is empowered to substitute the draining of low grounds for filling in all instances where, in his opinion, draining will as effectually answer the purpose.

Coroners are appointed by the governor, with the advice and consent of the Senate. They must be competent physicians. They hold office for two years. They receive an annual salary of \$1,000 each, and there is one for each of the police districts of the city of Baltimore. In addition, there is one known as the coroner at large, who takes the place of any coroner during his illness or enforced absence and receives the same compensation.

The coroner holds an inquest for every person found dead in his district when the manner and cause of death is not already known as accidental or in the course of nature. Each coroner makes a monthly report to the police commissioner of Baltimore city.

There is a board known as the anatomy board, which is composed of a demonstrator of anatomy from each medical school in the State, and to this board the coroner is authorized to transfer any bodies to be used for scientific purposes. If a person claims the body as a relative or friend and desires to bury it, the body must be surrendered for that purpose; or if the deceased person was a stranger or traveler who died suddenly, the body shall be buried.

Physicians or surgeons, before receiving any body to be used for scientific purposes, must give a bond that such body will be used for that purpose only.

The medical examiners act as coroners' physicians upon the request of a coroner or the commissioner of health, and are required to make post mortem examinations and such medico-legal inquiries as may furnish evidence, making a formal report in writing to the commissioner of health and to the State's attorney for the city.

The assistant medical examiner attends post mortem examinations or other medico-legal inquiries with the medical examiner, assists him, and in his absence discharges his duties.

Disinfection.—Disinfection is compulsory after smallpox, diphtheria, scarlet fever, and tuberculosis. Disinfection is performed for other communicable diseases upon request of the physician in at-

tendance. Disinfection for diphtheria is not performed until the report from the laboratory shows that a negative culture has been obtained from the patient and the other members of the household. Disinfection for tuberculosis is performed after death or removal of the patient upon notice received from the tuberculosis division. Disinfection for smallpox is performed as soon as the case is removed.

Disinfection for scarlet fever is performed when the physician in attendance has notified the department by card that the house is ready for fumigation, and after the matter has been examined into by one of the health wardens and the case found recovered; i. e., the termination of desquamation and the cessation of catarrhal symptoms.

A routine method is used for fumigation. The chemical used is solid formaldehyde contained in tin boxes with lamp attachment. Each box contains sufficient disinfectant for 1,000 cubic feet of space. Before the formaldehyde is liberated the room is sealed by wedging the windows against the jambs and plugging up cracks between door and frame or other places with folded pieces of newspaper. Strips of gum paper are not used for this purpose. Fireplaces are sealed by a mattress braced tightly against the opening. Control cultures are placed in the room. The exposure is six hours. After the process is completed—i. e., at the termination of six hours—the room is opened, not by a representative of the health department, but by a member of the household, who returns the culture to the health department by mail. The fumigators on leaving the house give the signed release form and with this children can return to school. Most of the disinfections are successful in that the culture is found to be killed, and from the practical side the experience has been that no case has developed after this disinfection unless it had very clearly been infected before the disinfection took place. This applies especially to diphtheria where there have probably been carriers in the house.

In the light of our present knowledge it is probable that just as good results would accrue if no terminal disinfection were practiced at all in most of the communicable diseases, and certainly much time, labor, and money would be saved. By this it is not to be understood that no precautions should be taken. On the contrary, they should be taken during the course of the disease.

During the year 1913 there were 5,413 houses fumigated on account of communicable diseases, or a total of 19,459 rooms.

Smallpox.—The duties of taking charge of smallpox patients within the city, feeding them while quarantined preparatory to transportation to the quarantine station, placarding the house, and arranging transportation to the quarantine launch, falls upon the head of this division, who, while not a physician, has had large experience in smallpox and is quite expert in recognizing the disease.

The final diagnosis is made in all cases by the assistant health commissioner.

The usual procedure is to take the patient from the house as soon as possible, isolate him in a special room in the health department, from which he is taken to a health department wharf in connection with the morgue, which is situated on the water front. This is a very convenient arrangement, as the patient can be taken away without undue publicity. It has been customary to remove contacts to quarantine also, but in the recent epidemic conditions became such that there was too much overcrowding, and contacts are now permitted to remain at the house without quarantine after vaccination.

The morgue.—The morgue, incinerator, and disinfecting chamber are located in the same building, which is on the river front, and has in connection with it a wharf to which the quarantine steamer can come. The morgue is provided with cold storage, by means of an ammonia machine, and is large enough to accommodate 12 bodies. In connection with this morgue there is also an autopsy room where the coroners' physicians perform autopsies at the request of the coroner, also necessary offices for the doctor and the morgue keeper.

In the incinerator are destroyed infected clothing and bedding which it is not deemed advisable to disinfect. The disinfecting chamber is a modern Kinyoun-Francis apparatus of medium size capable of disinfecting by steam or formaldehyde. It is constructed so that it is divided into two parts by a wall, the dirty end being in the room which contains the incinerating apparatus and the clean end on the other side of the wall in another room. The boiler in connection with it not only furnishes steam for the disinfecting chamber, but heats the building as well.

The dead bodies handled by this division are not necessarily taken to the morgue. Many are taken from private homes, and if paupers and unclaimed are either turned over to the anatomical board or buried in potter's field. Most of the bodies taken to the morgue are coroner's cases.

During the year 1913, 875 bodies were handled, including 240 taken to the morgue or delivered to the anatomical board, and 55 buried in potter's field.

Mosquito-breeding places.—One of the duties of this division also is to prevent the breeding of mosquitos by oiling stagnant pools within the city limits. Where it is not feasible to oil, the question is brought to the attention of a health warden, who investigates and handles it as a nuisance, requiring filling or draining to abate the same.

Coroners and coroners' physicians.—The ordinance relative to the appointment and duties of coroners has been included in this chapter because they bear a more or less direct relation to the department of health, although not a part of it.

The coroners lack organization, inasmuch as each works independent of the other and confines his particular work to his own district; he does not care even in an emergency to accept a case which may be just over the border line. To get the most efficient service from such an important office as the coroner's office there should be one coroner appointed for the city, who would be responsible and who should be given as many assistants as would be necessary to perform the work. He should have his office in police headquarters, and there should be a coroner on duty at all times.

Food and Dairy Inspection.

The supervision of foods and dairies is under the control of a well-organized bureau, created January 1, 1914, from the division of food and dairy inspection then existing. The personnel and their salaries at present are as follows:

| | |
|--|----------|
| 1 chief of the bureau..... | \$2, 000 |
| Assistant chief of the bureau..... | None. |
| Inspection division: | |
| 1 chief inspector..... | 1, 200 |
| 3 food inspectors, at \$900..... | 2, 700 |
| 8 city milk inspectors, at \$900..... | 7, 200 |
| 6 dairy farm inspectors, at \$1,080..... | 6, 480 |
| 1 bakery inspector..... | 900 |
| 1 local dairy farm inspector..... | 900 |
| 1 abattoir inspector..... | 900 |
| 1 supervisor of pasteurizing dairies..... | 1, 200 |
| Division of laboratories: | |
| 1 assistant chemist..... | 1, 200 |
| 1 assistant chemist..... | 800 |
| 1 assistant chemist..... | 720 |
| 1 laboratory assistant..... | 400 |
| 1 laboratory helper..... | 360 |
| 2 assistant bacteriologists, at \$1,000..... | 2, 000 |
| 2 bacteriological assistants, at \$480..... | 960 |
| 3 laboratory helpers, at \$240..... | 720 |
| Clerical division: | |
| 1 clerk..... | 900 |
| 1 stenographer..... | 720 |
| | <hr/> |
| | 32, 260 |

Duties of the bureau.—This bureau is really the combination of a division of food and drugs and a chemical laboratory, having special charge of the city's milk and food supply, and forms a very excellent combination to carry on the work which is required of it.

Requirements of ordinances.—The ordinances of the city of Baltimore relative to the sale of food and sale and production of milk have been summarized as follows:

It is unlawful to sell or have in possession any tainted, unsound, rotten, or partly decomposed fish, fruit, vegetables, or meat, or any food product that is kept fresh by the addition of salicylic, boracic acid, or other preservative.

After food has been condemned it is unlawful to remove it or to interfere with the confiscation or destruction of it by the commissioner of health or his subordinates.

It is the duty of the commissioner to cause inspection to be made of food products in the city and to obtain samples for analysis. The commissioner is authorized to appoint an analyst and three inspectors of food.

The term "food" is defined in the ordinance, as are the terms "sophistication," "unwholesome," "impure," and it is provided that in a warrant or other legal paper the term "impure" may be used to cover all of the other terms.

For violation of the ordinance relative to sale of food products, a fine is provided of not less than \$20 nor more than \$100.

It is unlawful to peddle oysters between the 1st day of June and the 15th day of September. For violation a fine is provided of \$20.

The commissioner of health is authorized to appoint an inspector of bakeries and confectioneries who shall be a practical baker and confectioner, whose duty it is to inspect places where cakes, confectionery, or similar products are made for the purpose of ascertaining their sanitary condition and cleanliness and the purity and healthfulness and wholesomeness of their ingredients. He reports his findings to the commissioner of health; for violation there is a penalty provided of not less than \$20 nor more than \$200.

This inspector first notifies an offender and if the law is not complied with within two weeks after such notice the penalties provided above are enforced.

The inspector is required by ordinance to furnish a bond of \$5,000 for the faithful performance of his duties.

It is unlawful to keep a cow or cows within the municipal limits unless located on an area not less than one-quarter of an acre, which must be set aside for their exercise. In all instances a permit must be secured from the commissioner of health. A fine is imposed for violation of not more than \$20 nor less than \$5 and \$1 for each day that the violation is continued after notice is given to discontinue.

No more than eight cows can be kept for each one-quarter acre of ground. A penalty for violation is provided of not more than \$20 nor less than \$5 and \$1 per day additional for each day that the offense is continued after due notice is given. The commissioner of health also has the power to revoke any license when cow stables are not kept in good condition.

When cows are so kept pasturage must be provided. For violation a fine is imposed of not more than \$20 nor less than \$5 and \$1 per day additional for each day that the offense is continued.

The owner of such cows must register with the commissioner the place where they are kept and a complete register thereof must be kept by him. For failure on the part of the owners to register a fine is imposed of not more than \$20 nor less than \$5.

A permit may be issued by the commissioner of health to keep not more than four cows on unimproved lots of less than one-quarter acre, but not less than one-eighth in area, provided that the stables provided have floors of cement or other nonabsorbent materials; windows on at least two sides, giving 3 square feet of window space for each animal, an air space in the amount of one-half cubic foot for every pound live weight of the animals; and that they are provided with equipment for securing absolute cleanliness. The regulation as to the size of the lot does not apply where cows are kept temporarily for sale, but that part of the ordinance which applies to the sanitation of the stables is also applicable here.

It is unlawful to sell any milk which has been mixed with water, drug, or any other article, under penalty of a fine of not less than \$20. It is also unlawful to sell milk from a diseased cow, under penalty of a fine of \$20.

Every person or corporation desiring to sell, offer for sale, etc., milk shall make application to the commissioner of health for permit on special form, giving full name and residence, location of business, number of cows, number of vehicles, and

any other information required. Before issuing the permit the place is required to be inspected. Any permit may be revoked for cause after giving the holder 10 days' notice in writing, except in the case of a temporary revocation on account of communicable diseases and insanitary conditions or similar causes on the premises. Permits are not transferable.

The sale of any milk or cream which is unsuitable or unsafe for human consumption may be prohibited by the commissioner of health. For violation of the ordinance there is provided a fine of not less than \$5 nor more than \$100.

All consumers of milk or cream are required to cleanse cans, bottles, or other containers after emptying and before returning them to the dealer. All dealers are required to cleanse all cans, bottles, etc., after they are emptied and before returning them to the producer, and all containers must be thoroughly cleansed before they are used for furnishing milk to the consumer. For violation there is a penalty of not less than \$5 nor more than \$50. No person may transfer milk or cream from one receptacle to another on wharves, railroad depots, or streets or wagons, except milk which is being delivered in bulk direct to the consumer, except that milk may be transferred from a relief wagon of a vendor to the proper receptacle on a delivery wagon or in case there is a leaky can. For violation there is a fine provided of not less than \$5 nor more than \$100.

It is unlawful to have in the possession of anyone bottling or vending milk or cream any acid, drug, chemical substance or compound to be used for coloring, adulterating, sophisticating milk or cream, unless there is secured a written permit from the commissioner of health to keep it for experimental purposes. For violation there is provided a fine of not less than \$5 nor more than \$100.

The commissioner of health or anybody authorized by him has the power to enter any building where milk or cream is handled, or the right of access to all wagons, railway cars, etc., used for the conveyance of milk or cream for the purpose of taking samples for inspection, testing, or analyzing. For violation there is a fine of not less than \$5 nor more than \$100.

With every sample of milk delivered to the department there must be a card containing information as to the time of delivery of the sample, number of dealer's permit, number of sample, date of collection, and name of inspector. Before instituting prosecution the sample must be taken in duplicate, both samples must be sealed and marked for identification, and the duplicate presented to the dealer, wagon driver, or the person from whom the milk is obtained. Before taking samples the milk in the receptacle must be agitated.

Pure milk is defined as that coming from healthy cows; which has not been deprived of any part of its cream; to which no additional liquid or solid preservative has been added; which at a temperature of 60° F. has a specific gravity of not less than 1.029; which has not less than 12½ per cent total solids and not less than 3½ per cent butter fats. Milk under this standard can not be sold. Skim milk or butter-milk may be sold, however, provided it be sold in its true character.

Buildings for stabling cows must be well lighted, drained, and constructed according to provisions already mentioned.

All cow stables must have cement or other nonabsorbent floor material, well drained, and connected with a sewer where possible.

All cow stables must have good and sufficient food troughs or boxes, with a covered water-tight receptacle outside of the building for the reception of manure or other refuse.

No receptacle for human excrement, and no animals besides cows, are allowed to be kept in any cow stable or room used for dairy purposes, nor may such place be used for habitation or as a workshop.

No stall may be less than 4 feet in width.

It is the duty of all persons connected with the premises to keep them thoroughly clean, in good repair, and well painted or whitewashed.

All manure must be removed from the premises, so as to prevent its accumulation in great quantities.

Cows must be cleaned every day and be properly fed and watered.

None but fresh, clean water may be used for watering stock, and proper receptacles must be provided on the premises for drinking water.

Inclosures must be properly drained, and no refuse, such as garbage or fecal matter, may be placed or allowed to remain in the inclosure, and no open drain is permitted to run through it.

Proper receptacles of nonabsorbent material are required to be kept for the reception, storage, and delivery of milk, and they must be kept clean and purified at all times.

Milk must be removed without delay from the cow stable.

Contagious or infectious diseases in cows must be reported immediately upon their discovery, and sick animals must be isolated.

It is the duty of any person owning or having control of cows used for dairy purposes, for sale or exchange, to submit such cows to the tuberculin test.

It is the duty of the person having charge or control of any premises upon which milk or cream is produced, etc., to report immediately to the commissioner of health any case of Asiatic cholera, croup, diphtheria, or any other communicable disease upon the premises.

No milk or cream may be sold, etc., on such premises, and no person who attends cows or milks them, or has the care of handling utensils, is permitted to enter any place where such diseases exist, nor have any communication with any person residing in a house containing a communicable disease.

The hands and persons of milkers or others engaged in the handling of milk and the bodies of the cows, especially the udders and teats, must be kept scrupulously clean.

For violation of any of these regulations a fine is imposed of not less than \$10 nor more than \$25.

Requirements of regulations.—Under the provisions of ordinance the commissioner of health has issued certain regulations defining the conditions under which milk may be produced and sold. The following is a summary:

Raw milk is required not to contain more than 500,000 bacteria per c. c. when delivered to the consumer.

Pasteurized milk may not contain more than 50,000 bacteria per c. c. when delivered to the consumer, and no colon bacilli in one c. c., as determined by cultural methods.

No person is authorized to feed to milch cows or cows any slops, refuse of any distillery, brewery, or vinegar factory, or any mash or refuse, or any canning-factory refuse, or food that has been subjected to fermentation, except silage.

INSPECTION DIVISION.

For convenience the operations of the bureau may be studied under several headings, according to the work assigned to its different inspectors.

Bakery inspection.—The inspector employed in this work devotes his entire time to the inspection of bakeries and bakery products. He has served in this capacity with the department of health for a number of years and is a capable man.

The ordinances covering the subject are too general and should be more specific to include the health of the employees, the protection

of the product from flies and other vermin, the proper disposition of waste matters, the unnecessary handling of bread, requiring the loaves to be covered, and prohibiting bakeries from being established in cellars or other insanitary places unfit for the purpose.

The bakery inspector makes a daily report of the bakeries examined and scores each bakery on a card devised for the purpose. This score card contains a place for the name of the proprietor, address, district, date, the location of the bake room (whether it is above ground or below ground), the light, ventilation, character of floor, walls, ceiling, sanitary conditions, and number, sex, and color of employees.

An inspection was made of numerous bakeries in different parts of the city; one especially good modern bakery was visited which carries on practically all of its operations by machinery. In the manufacture of the ordinary loaf of bread in this institution the bread is touched by the hand only twice, once after it has been shaped into loaves to put it in the bake pans and again after it is baked, when it is removed from an endless chain and transferred to the racks. The loaves of unusual shape, such as the long sandwich loaf, are molded by hand.

The flour is sifted by special machinery in the basement and is then carried up by a bucket-and-chain arrangement to the top floor, where it is automatically weighed, into the mixing chambers, mixed with water and yeast, and kneaded by means of paddle arrangements in the mixing chamber. It is then run into long portable tubs and allowed to rise. From these it is passed down by chutes to the next floor, one batch going to the machine which molds the loaf and another to the table where the loaves are molded by hand.

The machine contains a die which cuts a loaf of the exact weight required, molds it into a loaf, and passes it by a long endless chain through a heated chamber, which permits further raising of the dough. After it has gone the complete length of this chain, taking perhaps five minutes, it is removed to the bake pan and then placed in the oven; when baked properly it is removed to another endless chain, from which it is taken by hand and placed on the racks to cool. The loaves are not wrapped. This bakery is well lighted and ventilated, and everything is kept very clean.

The other bakeries visited were on a very much smaller scale, most of them being located in basements of small dwelling houses. One in particular was very clean and, although simple methods were used in the mixing and baking, everything was sanitary. Certain other bakeries visited were in poor parts of the town, and here quite opposite conditions existed.

A macaroni factory which was visited was entirely satisfactory from a sanitary standpoint.

Abattoir inspection.—The one inspector employed in this work gives his entire time to it, but it is very evident, considering the

number of abattoirs and slaughterhouses there are in the city, that he can perform but a small part of the work required, and many of the animals are slaughtered without undergoing any inspection. The State department of health, in addition to having an abattoir inspector who works in the city of Baltimore, gives to the city inspector a commission to represent it in this work. Even with these two men there is not a sufficient number of inspectors for the purpose. There is no ordinance requiring the slaughtering of animals at any special time, and, in fact, it would be unfair to pass such an ordinance limiting the time for slaughter and requiring that every animal be subjected to an ante and post mortem inspection, until there are more men to perform the duties. In fact the question will be difficult to handle unless many of the small insanitary slaughterhouses are closed and the slaughter of animals is permitted in a limited number of modern well-supervised abattoirs only.

The abattoir inspector makes a daily report, on a special form, of the abattoirs, slaughterhouses, and stores visited, the animals inspected, and the meat condemned.

A number of abattoirs and slaughterhouses, some of them being packing houses as well, were visited. Many of them occupied sites entirely too small for the purpose, and much improvement could be made in their sanitary condition.

The terms "abattoir" and "slaughterhouse," as used by the health department of the city and retained in this report, merely define the size of the establishment. A slaughterhouse is a place for the slaughter of animals for human consumption and operated on a very much smaller scale than is an abattoir.

Food inspection.—Three inspectors are engaged in the inspection of food products, and while not particularly concerned with milk are directed to pay attention also to this article when it is sold at a place undergoing inspection. Judging from the number of milk permits that are revoked by these inspectors for violations of the milk ordinances and regulations, they seem to be more efficient as milk inspectors than are many of the men regularly employed for the purpose.

The food inspectors are especially engaged in inspecting food products in markets, restaurants, stores, and other places where food is sold, and are authorized to condemn any food which is spoiled or unfit for human consumption. This food is usually denatured by covering it with petroleum or a phenol disinfectant and it is taken to the garbage disposal plant or rendering establishments and destroyed. The inspectors are not required to pay any special attention to the sanitary condition of the premises and usually confine their inspection to the products. The food inspectors make a daily report containing information as to the total number of

stores, wharves, and markets visited and the amount of food condemned. In addition to this there is a special report made of the food condemned, where it came from, to whom it was consigned, why it was condemned, and how it was disposed of. The different food products to be condemned are marked with a "condemned" card, and if for detention only pending further investigation, they are marked with a card stating that fact.

The ordinances covering the sanitation of places where food products are sold, and the protection of foodstuff from contamination by dust, flies, or other vermin are very inadequate. There is no ordinance requiring the screening of stores or the screening of foods; food is exposed for sale on the streets as well as in the market without any protection. Food which is eaten raw, such as watermelon, has been seen exposed for sale on the streets and covered with flies. There is no ordinance which requires the food to be raised from the ground. The markets are known all over the United States for the bountiful supply of foodstuffs which they contain, but nevertheless they could be greatly improved in their sanitary condition. Most of them are in need of reconstruction along modern lines.

Local dairy farm inspection.—All inspectors employed in this work are mainly engaged in inspecting those producing farms which are within close proximity to Baltimore and haul their milk by wagon into the city. The amount of milk obtained from this source is approximately 6,000 gallons per day. The same forms are used in reporting on these farms as are used for the farms shipping milk by railroad.

These inspectors are also engaged in the inspection of premises within the city where application has been made to keep cows. There are practically no producing farms within the city limits.

The supervision of pasteurizing plants.—One man is engaged in this work exclusively, and his duties are to study the methods pursued in the different pasteurizing plants in the city with a view to improving them; to study the character of the milk before and after pasteurizing; to keep check on the methods and report and remedy bad technique; and to carry on any studies that may tend to improve the product.

There are at present no ordinances setting a bacteriological standard for milk, although regulations promulgated by the commissioner of health define a maximum of 500,000 bacteria for raw milk and 50,000 for pasteurized milk. The studies being carried on are preliminary to drawing up an ordinance on the subject which will be thorough and consistent with local conditions.

The standard set by some cities for pasteurized milk, namely, that there shall be a reduction of 99 per cent in the bacterial content, does not seem to be logical. Nor is a standard specifying the maximum

number of organisms that will be permitted in a pasteurized milk entirely satisfactory.

The problem is to render harmless any pathogens that may be present and to destroy or reduce in numbers as far as practicable all saprophytes such as the peptonizing bacteria that may indirectly cause sickness among the milk consumers.

It has been determined by laboratory experiments that a temperature of 145° for 20 minutes will kill all pathogenic organisms. It has also been found by practical experimentation that where milk is being pasteurized in bulk, 20 minutes is not sufficient, because the milk is heated in layers, so to speak, and so within this time the entire bulk of milk does not reach the required temperature. At least 30 minutes are necessary to secure a satisfactory pasteurization where milk is pasteurized in bulk. A temperature of 145° for 30 minutes does not alter the character of the food constituents of the milk nor will it kill all of the beneficial lactic-acid bacteria, some of which resist a temperature of 145° . It is true that this temperature and times will not destroy all the peptonizing bacteria where there is spore formation, but this is no argument against pasteurization. These bacteria were present in the raw milk and pasteurization has, if not entirely destroyed them, at least reduced their number. Immediate cooling and bottling under aseptic conditions limits further multiplication.

The important factors in pasteurization are the temperature used, the length of time this temperature is maintained, sterile apparatus, and prompt cooling and bottling. If every pasteurizing plant were required to install efficient apparatus, equipped with a thermoregulator and temperature recorder, and with means of securing absolute cleanliness, by which is meant asepsis, standards for pasteurized milk would hardly be necessary.

The inspection of the pasteurizing dairies of the city discloses the fact that there are numerous methods used, including different temperatures of pasteurization and different lengths of exposure, some of them being a flash system at a low temperature and therefore incapable of producing really satisfactory pasteurized milk, and certainly making it impossible to get any uniform results.

There are three liquids over which the governmental authorities should have unlimited control, namely, water, milk, and alcoholic beverages. In the case in point it would seem the only reasonable and logical thing for the municipality to establish one or more municipal pasteurizing and bottling plants located at railway depots where the most milk is brought into Baltimore and requiring that milk for sale in the city should be pasteurized and bottled at these plants or at a private plant where efficient methods are used. In either case the milk should be sold only in unbroken packages. An

exception to this might be made when milk or cream is sold for the purpose of manufacturing ice cream, or to bakeries and confectioneries, in which case it might be delivered in bulk.

At a very small charge a municipality could make such a plant pay expenses and could insure, with proper supervision, that milk harmless to the public health would be furnished to the poor as well as to the rich.

It would be necessary to bring the milk to the plants where it could be properly tested, then pasteurized and bottled and returned to the distributors, and a charge of $\frac{1}{2}$ cent a quart or even 1 cent a gallon would probably be more than enough to cover running expenses.

City milk inspection.—Of the eight men employed in city milk inspection work, one collects sterile samples at the pasteurizing plant before and after pasteurization; inspects dairies, and on Tuesdays, Thursdays, and Saturdays collects sterile samples of milk at certain of the railway depots. Three men are especially concerned in the collection of samples of milk from stations, wagons, stores, and lunchrooms for bacteriological examination. This leaves four men to perform the regular district work. As there are 3,430 places having permits to sell milk, each inspector is required to inspect 857 places, in addition to the inspection of milk and the taking of samples for chemical analysis at depots and from wagons.

Most of the morning is consumed in the inspection of milk arriving at the different railroad depots. The total amount of milk received at depots during the year 1913 was 9,345,860 $\frac{1}{2}$ gallons, of which 6.1 per cent, or 573,104 gallons, was inspected. For lack of time, this inspection is sometimes very superficial. When done thoroughly, however, it consists of first, stirring the milk with a dipper, then filling the lactometer cylinder and taking the specific gravity and temperature, noting the way in which the milk flows off the lactometer and the amount that adheres to it, and after correcting the specific gravity for temperature, passing or condemning the milk as indicated by the tests. The specific gravity according to ordinance must be not less than 1.029 at 60°. An inspector with intelligence and experience rarely condemns a milk that does not subsequently prove under standard. On the other hand, much milk is passed which probably should be condemned. Samples of condemned milk are always taken to the laboratory for analysis.

Heretofore all such milk has been spilled, but in the future it is the intention to denature it by means of rennet, a substance which will destroy the character of the milk and yet permit its use in feeding animals.

Where milk is spilled and afterwards laboratory tests find that it was up to the standard, the owner is reimbursed for his loss.

When milk is condemned the can is marked with a red "condemned" tag and the necessary report made to the bureau. Score cards are filled in for the city milk plants, stores, and lunchrooms, and daily reports made by the inspectors of the work accomplished.

The milk sent in by railroad from the dairy farms represents both night and morning milking. The night's milking is placed in the spring house until the morning, when it is shipped with the morning's product, usually in uncovered wagons, to the railroad depot. Here it may remain on the platforms, which are usually uncovered, for a varying period of time, until it is placed on the train for Baltimore. The cars are neither refrigerated nor provided with ice. Few of the milk producers provide ice, but depend on springs for cooling, which in summer may have a temperature as high as 65°, and in winter 55° or lower. The cans are usually labeled as to whether they contain night or morning milk, so that when they arrive in Baltimore the distributor who does not pasteurize will be able to distribute the oldest or night's milk first and the morning's milk the next morning. It is then not less than 18 hours' old by the time it has reached the consumer. The night's milk is usually colder than the morning's milk for the reason that it has been in the spring house all night, whereas the morning's milk has been there probably not more than an hour.

An interesting series of observations of temperature was carried on by Dr. Blanck, chief of the bureau, from the time the milk arrived at the depot of departure until it arrived at the depot in Baltimore. These observations were carried on along the different railroad lines running into Baltimore and transporting milk in the months of June and August, 1911. The temperature of the milk was taken as soon as it arrived on the station platform at the place of departure, immediately after it was loaded on the car, and again after it arrived in Baltimore. He found that in time varying from 41 minutes to 3 hours and 15 minutes (the minimum and maximum time between which the milk was received at the depot of departure and arrived in Baltimore) there was an average rise in temperature of from 1.2° to 3.4°.

Practically all of Baltimore's milk comes from an area within 60 miles of the city and the hauls are therefore all short. Most of the milk arrives in Baltimore after 8 o'clock on the morning or between the hours of 8 and 11 and an effort is made by the department to inspect this milk within one-half hour after its arrival, so that there will be as little delay as possible in turning it over to the distributor.

Persistent work by dairy-farm inspectors has resulted in a marked improvement of the milk this year over previous years in that it is received at the depot with a very much lower average bacterial count than formerly. The reasonable standard, a temperature of 50°,

makes it possible for dealers in milk to keep pretty close to or below it. The producers, however, are not so successful. For instance, the average daily temperature at the station in June, 1913, was 62, in July 64.5, in August 64.7, and in September 59.8. The average daily temperature of milk in wagons was in June, 1913, 51.4, in July 52, in August 50.9, and in September 52.2. The average daily temperature of milk in stores was in June, 1913, 50.8, in July 49.3, in August 50.8, and in September 50.4. The average daily temperature of milk in lunchrooms was in June, 1913, 45.5, in July 46.2, in August 46.7, and in September 50.

Notwithstanding the fact that a lower temperature is maintained after the milk leaves the depot, the bacterial count became higher, inasmuch as the average count of raw milk at the depot was 1,070,000, from wagons 3,385,000, from stores 7,780,000, and from lunchrooms 5,932,000.

These counts are entirely too high and far below the standard of 500,000, which is a generous standard for raw milk. No standard is set for inspected or certified milk.

An inspection was made by me of the stores selling milk in two of the districts of the city. One was located on the outskirts of the city in a good neighborhood. There were seven places inspected in this district, five of them being on Park Heights Avenue between the 3,600 and 4,300 blocks, two of them being each one block from Park Heights Avenue. One was a dairy, the others were stores. In every store the milk was sold in original unbroken packages, was kept in a separate compartment of a large refrigerator and the conditions were as good as could be expected. The fact that milk is sold in original unbroken packages and is kept in an ice box is of itself sufficient to score the place very high. The dairy in this district was far from satisfactory, was very small, and operated on a very inexpensive scale, making it difficult to institute reforms. This district was inspected in just about one hour, while it took the inspector who had last been in the district more than twice that time to cover it and then he did not visit the dairy nor did he visit one of the stores. There were also numerous things that required reporting which he made no mention of whatever. It should be stated that he scored the places visited, thereby requiring somewhat more time, as to score a place requires about 10 minutes.

The other district visited was of a different type altogether. It was located in the slums, among the foreign population. Here all the milk was sold in bulk under the most insanitary conditions. To make regulations here is practically hopeless. There are but three things to be done—stop the sale of milk in such places, establish a municipally controlled dairy within the district, or prohibit the sale of anything but bottled milk in original packages. This latter

has a disadvantage, in that the people who buy milk in these localities frequently buy very small quantities at a time and it is not practicable, according to the dealers, to bottle milk in anything less than 1-pint containers. A municipally controlled pasteurizing and bottling plant would make it possible to supply the poor with safe milk in any sized container they would require.

Dairy farm inspection.—There are six men employed in the inspection of farms shipping milk to Baltimore; three of these men were obtained through the efforts of the women's civic league and all are capable. These inspectors are assigned districts taking in the dairies along a certain line of transportation. They are entitled to traveling expenses up to \$1,000 a year to cover railroad transportation, food and lodgings, and carriage hire. They work in the field from Monday until Friday evening, and Saturday report to the laboratory, where they submit their score cards of the dairies inspected, talk over matters with the chief of the bureau and obtain results of examination of milks for future reference when they reinspect their dairies. These inspectors do not submit samples from the dairy. Upon the inspection of each dairy a score card is made out similar to the score card used by the Department of Agriculture, which, to my mind, is deficient in several ways, in that it does not emphasize the importance of noting any case of sickness on the dairy farm or among those who handle the milk; the character and location of the privy, and the character of the water used for cooling the milk or cleansing the utensils—three very important matters from the standpoint of the transmission of human diseases.

Of all the inspectors employed in milk inspection these dairy farm inspectors are carrying on the most important part of it, as it is at the source where the remedial measures should be applied and where thorough instruction in the principles of cleanliness should be given.

To produce a good milk it is not essential that expensive machinery be installed, for there are dairy farms furnishing excellent milk, clean and high in butter fats, with only simple arrangements at their disposal, but where the owner is intelligent and applies cleanly methods throughout.

One of the four inspectors is a graduate in veterinary medicine and his time is mostly taken up with special investigations relative to the health of milch animals on producing-farms, from which samples of milk have been obtained showing high leucocyte or streptococcus counts. This leaves but three inspectors for the regular dairy farm inspection, or one inspector for 656 farms. The number of inspectors should be increased by at least three, making it possible for each inspector to visit every farm in his district once every two months.

In the foregoing the terms "dairy farm" or "producing farm" are held to mean places where milch cows are kept for the purpose of producing milk for sale.

The term "dairy" is confined to places which keep on hand for sale, milk or cream, or at times other dairy products exclusively.

The term "store" refers to a place which sells milk or cream in addition to articles other than dairy products.

Collection of samples.—Four specially trained inspectors are engaged in collecting samples of milk for bacteriological examination. They carry with them a set of sterilized paddles for stirring the milk, and wrapped, sterilized, glass-stoppered bottles.

The milk is thoroughly stirred in the can by means of one of the sterilized paddles, the same paddle being used for different cans belonging to the same shipper. The bottle, previously wrapped in paper, as described below, and sterilized, has the stopper connected to its neck by a long piece of wire. When used, the stopper is removed, keeping it within the paper covering and by means of the long wire the bottle is withdrawn from its wrapper and immersed in the milk can, withdrawn, the stopper replaced in the bottle, and then put in a tin box containing ice.

This is a very simple and efficient means of collecting the sample without making it necessary for the inspector to touch the bottle and thus contaminate the milk.

Two pieces of paper are used in wrapping; one covers the lower half of the bottle, the other the upper half including the neck and stopper. When the stopper is removed, still under its paper covering, the wire which is coiled around the neck uncoils and finally the entire bottle is lifted out of its remaining wrapper. The fingers of the operator touch the paper only.

Samples from wagons delivering milk in bulk are taken direct from the spigot of the container.

Milk inspectors ordinarily carry with them a regular case containing 1 lactometer cylinder made of copper, 1 lactometer and thermometer combined, 9 to 18 cork-stoppered bottles, 1 lamp for sealing samples, 1 dipper, towels, necessary blank forms, and ice where bacteriological samples are to be collected or where chemical samples are taken in the summer time.

At the railway depot the dipper is used for stirring the milk and for filling the cylinder, the sample bottle being filled from the cylinder. This dipper is made to fold at the middle of the handle so that it will fit the carrying case. They are sterilized before the inspector starts out on his rounds. Arrangements are now being made at the depots whereby the dippers can be sterilized by live steam immediately after use. Many samples of milk are taken from the delivery wagons, stores, and lunchrooms, mostly raw milk sold in bulk. Where an original container is taken as a sample a receipt is furnished to the driver.

Samples taken with a view to prosecution are obtained in duplicate and sealed, one bottle being delivered to the person handling the milk

and the other taken to the department of health. The method of sealing bottles is by the use of sealing wax, which is melted in a very ingenious container easy to carry around. It consists of a copper cylinder, into the bottom of which is inserted a copper alcohol lamp closely fitting the cylinder and into the top of which is inserted a receptacle for the sealing wax, with a hinged cover. For sealed samples cork stoppers are used. The cork is cut off flush with the rim of the mouth of the bottle and then inserted into the hot sealing wax and imprinted with a seal containing the letters B. H. D. It is seemingly impossible to tamper with these seals. Care must be taken not to have too much sealing wax in the reservoir or it will boil over, and not to heat too long, for the same reason.

All samples for analysis must be accompanied by properly filled-in forms giving necessary data.

LABORATORY DIVISION.

The chemical laboratory.—The chief of the bureau is the immediate head of the chemical laboratory. This laboratory is well equipped; its force is composed of young men who have been trained in the laboratory and who seem to be capable. The work consists of the chemical analyses of milk and water mainly, the analysis of foods and the identification of suspected poisons for the police department. The examination for poisons in stomach contents or viscera is not carried on in this laboratory. One chemist has been especially trained in the examination of poisons, one is especially trained in the analysis of water, and another in the analysis of milk.

From consideration of the chemical laboratory of the city in relation to the food and drug division of the State, it would seem there is lost motion, because of an apparent lack of cooperation and because the State is performing much work within the city that the city could perform for itself, and at the same time permit the State to carry on its operation in other localities within the State where there is no machinery for enforcing a law for the purity of foods.

The city can not prosecute under the State food and drug act and its ordinances are deficient, but it seems highly reasonable for the State to give the city inspectors authority to collect samples of foods and drugs within the city, thus permitting the State inspectors to devote their time to the collection of samples in other parts of the State.

Bacteriological work.—In addition to the chemists the chief of the bureau has directly under his control a certain number of bacteriologists, whose special work is the bacteriological examination of milk. These men perform their work in the bacteriological laboratory of the department of health under the supervision of the chief of the bureau of food and dairy inspection. The subdivision of authority

hardly seems wise, as the logical arrangement would be to have all bacteriologists under the immediate control of the chief of the bacteriological laboratory, who is after all responsible for the technique of all of the bacteriologists. It appears, however, that it not infrequently happened that other work of the bacteriological laboratories was inadvertently given preference over the examination of milk, thereby interfering with securing prompt reports on milk samples.

Library.—The bureau of food and dairy inspection has a very excellent working library which is kept in the bureau and not in the general library of the department. The books in this library have been carefully selected and are referred to constantly, and it would seem best to have them in the bureau so that they can be consulted without delay. In addition to the books there are 11 different journals subscribed to by the bureau, and the chief of the bureau has a number of journals and reprints which are at the disposal of his subordinates. The chief has also organized a journal club, each one of his subordinates being given a certain journal to review with special reference to the particular subject in which he is interested. The entire staff of the chemical laboratory is at present engaged in taking a special course in bacteriology at the College of Physicians and Surgeons, so that each member will be thoroughly familiar with all sides of the bacteriology of milk as well as of other foods.

The books and journals in the library are catalogued, or in process of being catalogued, so that subjects can be looked up readily.

Records and reports.—Score cards are filled in at the time of inspection of farms, dairies, stores, and lunch rooms. These are placed in separate files.

Each inspector is required to make an individual daily report on regular form, and the information taken from these is summarized on another daily report by the clerk of the bureau. This summary also includes the laboratory reports for the day. These reports are kept in separate files.

When samples of milk are taken for analysis, special forms are filled in containing the necessary data, to which is added the result of the examination when it is completed. Separate cards are kept of the same kind, one for bacteriological and one for chemical analyses. These cards cover samples from depots, wagons, stores and lunch rooms, and pasteurizing plants, and are filed in special files.

When any person wishes to sell milk within the city limits he is required to make application for a permit on a special form. This application is then referred to an inspector, who inspects the premises and determines whether it is a proper place from which to sell milk and makes the necessary recommendations. A permit is then issued by the commissioner of health. Three records are kept of these per-

mits, one of the permit number, one of the address, and one of the name; a file is also kept of the trade names of dairies.

Where low butter-fat content is found in any milk, notice is sent to the person from whom the milk is obtained, either the producer or the dealer, and a record of these notices filed. The same procedure is used for milk having a high bacterial count. This notification does little good, as shipments from the same dealer are not systematically followed up to determine if there is any improvement.

A file is kept of the stores, etc., by districts. There are 167 districts made for the convenience of assigning the inspectors to their daily work, and the assignments are so arranged that quite a period elapses before the inspector covers the same territory a second time. A file is kept of the revocation of milk permits, temporary and permanent, not including temporary revocations on account of quarantine. Permits are revoked for violation of the rules and regulations controlling milk, as, for instance, when a place handling the milk is in an insanitary condition and where a refrigerator is not provided.

The clerk every morning examines the record of the communicable disease clerk, reporting cases of measles, scarlet fever, diphtheria, or typhoid fever occurring at any address where milk is sold. Such places are then immediately quarantined and the license temporarily revoked. Where cases of these diseases occur on any special milk route the case is first investigated by the health warden; then the milkman is notified that a case of disease has occurred on his milk route. In case of tuberculosis, permits are revoked only upon recommendation of the tuberculosis division. A record of these temporary revocations is kept in a "daily reminder" file until the permit is again granted, when it is placed in a separate file.

A file is kept of the above diseases occurring on the milk routes of the different dealers. By this file one can readily determine the presence of an unusual amount of sickness along any particular route.

A record is also kept of the employees of dairies; of the amount of milk condemned; of the amount of food condemned; of the number of cows within the city limits; and the number of sealed samples taken. The score cards are filed with the application.

In addition to these records there is a tabulation showing the districts that have been covered, with the name of the inspector and the date of inspection; there is also a daily record showing the assignment of each inspector for that particular day.

A record is kept of all prosecutions and the findings of the court. A number of prosecutions have been carried on for selling milk without a permit; for selling milk which is below standard; or for other reason; and they have been uniformly successful, the majority of the defendants being fined and required to pay the costs.

A record of water analyses is kept and a special record of all other analyses on special forms, which are bound in a loose-leaf ledger. This record contains, with other data, details of the examination which can be used as evidence in court where prosecutions are instituted.

After a study of the different records filed in the bureau, one might jump to the rather hasty conclusion that is there a duplication. This probably, however, is not the case, for it would seem on closer study that the files are quite satisfactory and that all the information filed away is needed. There are a few suggestions, however, that might be made relative to the forms used, as, for instance, the inspection card which is to be hung in stores, etc., should contain a place for the hour of inspection and possibly should have certain questions to be answered at each inspection as to the condition of the refrigerator, the temperature, sanitary condition of the store or the score at last inspection. Then, again, the inspector should be made to report more in detail on his daily report the premises inspected, by name and house number and hour of inspection. This would make it easier for the chief inspector to check up the work of the men under him.

Certain changes are desirable in some of the score cards.

Summary of information relating to the inspection of the milk and food supply of Baltimore City, 1913.

| | |
|---|---------|
| Milk producers shipping by rail..... | 1, 968 |
| Milk producers hauling by vehicle..... | 116 |
| Number of local dairies..... | 211 |
| Number of dairies in counties..... | 29 |
| Number of dairy farms visited, 1913..... | 1, 098 |
| Total number of dairy-farm inspections and reinspections, 1913..... | 1, 548 |
| Number of near-by dairy-farm inspections, 1913..... | 1, 779 |
| Maximum score..... | 88.00 |
| Minimum score..... | 12.45 |
| Average score..... | 50.84 |
| Per cent of farms having tuberculin-tested herds..... | 3.00 |
| Per cent of farms using small-top milk pails..... | 9.05 |
| Per cent of farms having special cooling apparatus..... | 4.00 |
| Per cent of farms having no dairy house..... | 24.22 |
| Number of pasteurizing dairies in the city ¹ | 19 |
| Number using flash type of pastuerizer..... | 9 |
| Number using holding type of pasteurizer..... | 9 |
| Time of pasteurization.....minutes.. | 2-30 |
| Temperature of pasteurization.....degrees F.. | 140-155 |
| Total daily output of pasteurized milk.....gallons.. | 12, 300 |
| Pasteurizing dairies having facilities for sterilizing bottles..... | 9 |
| Pasteurizing dairies having steam sterilizing apparatus..... | 16 |
| Pasteurizing dairies using hot water only..... | 2 |
| Pasteurizing dairies having system of dairy-farm inspection..... | 5 |
| Pasteurizing dairies doing bacteriological and chemical laboratory work.. | 4 |

¹ The data from one of these dairies was not secured.

| | |
|---|------------|
| Pasteurizing dairies selling bottled milk only..... | 3 |
| The amount of milk distributed daily by the largest pasteurizing dairy, gallons..... | 4,000 |
| The amount of milk distributed daily by the smallest pasteurizing dairy, gallons..... | 60 |
| Number of wagons operated by pasteurizing dairies..... | 172 |
| Number of people employed..... | 365 |
| Number of pasteurizing dairies producing their own milk..... | 2 |
| Number of farms supplying the other 16 pasteurizing dairies..... | 746 |
| Number of gallons of milk arriving at railroad depots, year 1913..... | 9,345,860½ |
| Per cent of milk examined at railroad depots, year 1913..... | 6.1 |
| Estimated number of gallons of milk arriving by electric railway, year 1913..... | 30,000 |
| Estimated number of gallons of milk arriving by vehicles daily..... | 6,000 |
| Estimated average daily consumption of milk, 1913..... | 31,600 |
| Number of special investigations of dairy farms, 1913..... | 149 |
| Number of cows temporarily excluded from herd..... | 251 |
| Number of cows permanently excluded from herd..... | 7 |
| Number of farms where entire output of milk was excluded..... | 5 |
| Total amount of milk condemned, 1913.....gallons.. | 7,312½ |
| Total number of local milk shops and distributing dairies quarantined in 1913..... | 118 |
| Average per cent of butter fat, milk from farms..... | 4.01 |
| Average per cent of butter fat, milk from wagons (bulk)..... | 3.71 |
| Average per cent of butter fat, milk from stores..... | 3.53 |
| Average per cent of butter fat, milk from lunchrooms..... | 3.76 |
| Average bacterial count, raw milk from farms..... | 1,070,000 |
| Average bacterial count, raw milk from wagons..... | 3,385,000 |
| Average bacterial count, raw milk from stores..... | 7,780,000 |
| Average bacterial count, raw milk from lunchrooms..... | 5,932,000 |
| Per cent of samples raw milk from farms conforming to bacterial standard, 1913..... | 71.00 |
| Per cent of samples raw milk from farms conforming to bacterial standard, 1912..... | 44.00 |
| Per cent of samples raw milk from wagons (bulk) conforming to bacterial standard, 1913..... | 37.00 |
| Per cent of samples raw milk from wagons (bulk) conforming to bacterial standard, 1912..... | 18.00 |
| Per cent of samples raw milk from stores (bulk) conforming to bacterial standard, 1913..... | 25.00 |
| Per cent of samples raw milk from stores (bulk) conforming to bacterial standard, 1912..... | 31.00 |
| Number of temporary revocations of milk permits for violations of rules and regulations..... | 187 |
| Number of permanent revocations of milk permits..... | 13 |
| Total number of permits effective December 31, 1913..... | 3,430 |
| Total number of bakeries within the city..... | 342 |
| Total bakery inspections..... | 3,400 |
| Bakeries ordered cleaned..... | 82 |
| Total number of abattoirs and slaughterhouses within the city..... | 87 |
| Total number of abattoir inspections..... | 591 |
| Total number of visits to slaughterhouses..... | 3,451 |
| Total number of inspections of animals on hoof (cattle, sheep, hogs, calves)..... | 598,830 |
| Total number of carcasses condemned..... | 634 |
| Total number of store inspections, food products (including milk)..... | 31,338 |

| | |
|--|----------|
| Total number of market inspections, food products..... | 4,576 |
| Total number of wharf inspections, food products..... | 3,950 |
| Total amount of foodstuffs condemned.....pounds.. | 656,927½ |

LABORATORY RECORD.

| | |
|---|--------|
| Number of milk analyses, chemical..... | 22,757 |
| Number of water analyses, chemical..... | 163 |
| Number of miscellaneous analyses, chemical..... | 1,323 |
| Number of milk examinations, bacteriological..... | 8,916 |
| Number of water examinations, bacteriological..... | 1,337 |
| Number of miscellaneous examinations, bacteriological (food)..... | 236 |
| Total number of prosecutions for violations of milk ordinances..... | 36 |
| Total number of prosecutions for violations of food ordinances..... | 8 |
| Total number of convictions..... | 36 |
| Total number of dismissals..... | 8 |

Bacteriological Work.

A division of bacteriology was organized in 1896. In 1898, the State board of health, desiring to organize a laboratory, combined with the city in organizing a common laboratory. This arrangement still exists.

At present the personnel and their respective salaries are as follows:

| | |
|--|--------------|
| Chief of division ¹ | \$1,800 |
| 1 assistant bacteriologist..... | 1,500 |
| 1 assistant bacteriologist..... | 1,200 |
| 1 assistant bacteriologist..... | 1,000 |
| 1 laboratory assistant..... | 900 |
| 1 specimen collector..... | 900 |
| 1 laboratory assistant..... | 480 |
| 1 laboratory assistant..... | 300 |
| 2 laboratory assistants, at \$240..... | 480 |
| 2 throat inspectors, at \$500..... | 1,000 |
| 1 clerk..... | 950 |
| | <hr/> 10,510 |

Duties of the division.—The laboratory is engaged in work similar to other laboratories of its kind. Physicians are assisted in the diagnosis of all communicable diseases by the examination of cultures or other specimens. Bacteriological examinations of water and foodstuffs, raw or preserved, are made. There is also manufactured and issued antityphoid vaccine, and diphtheria antitoxin and vaccine virus are issued. Disinfectants for the disinfection of stools from cases of typhoid fever or other intestinal diseases are given away free of charge.

Requirements of ordinances.—There are no specific ordinances applying to the bacteriological laboratory or to its work.

Methods of operation.—The chief of the division has under his supervision the assistant bacteriologists and other employees of the

¹ The chief of the division of bacteriology is also chief of the State bureau of bacteriology and as such receives an additional \$1,800 from the State.

division and is responsible for their discipline and their work. He also gives his personal attention to the examination of diphtheria cultures, the examination for malarial parasites, the tests for typhoid fever, and the rabies work.

The bacteriological work is divided among the three assistant bacteriologists. The routine duties of each are specifically defined by laboratory rules.

One of the laboratory assistants prepares and distributes laboratory outfits for the transmission of specimens for examination to the various culture stations throughout the city. During this distribution he collects from these culture stations blood serum outfits which are two weeks old or over. Substations are also provided with outfits, but they are required to send to the department to secure them. A record is kept in duplicate of all outfits issued.

Another laboratory assistant, who is known as a specimen collector, collects samples of pasteurized milk in original packages on the street, collects tap-water samples from the different parts of the city and specimens of raw foods for examination in the laboratory. Recently he has been attempting to trap rats to be examined for possible bubonic plague. He is also required to make an occasional sanitary survey at the time that he is sent to collect water samples, and also to make special investigation when there is a complaint in connection with any water supply.

The other laboratory assistants are boys who are engaged in cleaning glassware, sterilizing apparatus, preparing culture outfits, cleaning up, filling in blanks, etc. These boys are too young to assume any responsibility, and while they may be trained so as to eventually become efficient laboratory assistants it is questionable whether it is advisable to employ boys for this kind of work.

The laboratory is at present engaged in determining also the efficiency of the use of hypochlorite in the city water by an examination of tap water in different parts of the city. Examinations at the plant are made by the water engineering force.

It would seem best to have all of these examinations made by a bacteriologist from the laboratory of the department of health, even though he had to be stationed at the plant. While it is of course the water engineer's duty to provide the water supply and maintain it, it should be the duty of the health department to determine at all times whether the water is fit for drinking purposes. Where the bacteriological work is divided, as in this case, important changes can take place that may affect the health of the city and the health department know nothing about it, and there is very likely to be a conflict of opinion which need not occur.

There are six different outfits for the use of physicians to submit samples of materials for examination. Only one of these outfits is

intended for mailing; the others must be sent to the health department by other means.

One outfit consists of a wide-mouthed bottle with cork stopper. In the bottle is a small amount of disinfectant solution, and accompanying the outfit are directions for collecting the sample and a blank form for data on the case, to be filled in by the physician. This is used for samples of sputum in suspected tuberculosis. It is similar to the container used by the State.

The outfit for diphtheria specimens consists of a test tube containing a sterile swab and a tube of Loeffler's blood serum mixture, two blanks for the necessary data, to be filled in by the physician, one for first cultures and one to be used in any succeeding cultures, and information as to how to take cultures. The physician inoculates the culture tube and sends it to the laboratory, where there is some one on hand at all times to receive it and place it in the incubator.

There is another outfit to be used for the transmission of specimens of blood, feces or urine for examination for intestinal diseases or for the Widal test. This outfit consists of a swab and a bile culture tube, which is inoculated by the physician from the feces, urine, or blood, and also a small aluminum box containing cover slips for the transmission of dried blood. Blanks to be filled in by the physician and information as to how to collect samples are also inclosed.

Another outfit consists of a block of wood containing a small aluminum box inclosing glass cover slips and intended for the transmission of dried blood in cases of typhoid fever or malaria. Still another consists of a number of glass slides, properly packed, for miscellaneous examinations such as pus from anthrax, ophthalmia neonatorum, etc. This outfit also contains blanks for necessary data on the case, as well as information as to how to collect the samples.

The sixth outfit consists of a wooden block inclosing a small aluminum box containing a culture medium contaminated with some harmless organism. This is exposed in a room undergoing disinfection, as a control to determine whether the disinfection has been efficient. After use, the culture is mailed to the health department for examination.

The laboratory is well equipped for any kind of bacteriological work. There are numerous sterilizers and water baths, a large ice box refrigerated by means of an ammonia machine and having in it a compartment containing a 20° incubator. The refrigerator is kept a few degrees above zero centigrade. The incubator within it is kept at 20° by means of a resistance coil, the temperature being regulated by a thermoregulator devised by one of the chemists of the chemical laboratory, which is accurate to one-half of a degree. It is a very ingenious contrivance and a description of it should be published by the inventor as it would no doubt be useful in other laboratories.

The large incubator is kept at the required temperature by means of hot water and a thermoregulator.

Records and reports.—Each specimen sent in for examination is accompanied by the necessary data on a regular form filled in by a physician. These are filed away, there being four files for diphtheria, one containing first positives, one first negatives, one second positives, and one second negatives. There are two files for tuberculosis, one for positives and one for negatives; one for typhoid positives, one for typhoid and malaria negatives, one for blood, urine, and feces cultures positive and one for negative, and one for diphtheria in institutions, while a separate file is kept for those examinations in which the results are unsatisfactory or suspicious. In addition to these files, a filing card is made out for each condition, information being taken from the reports from the doctors.

Records are also kept of the number of doses of diphtheria antitoxin and antityphoid vaccine given out and returned; also the amount of vaccine virus issued.

Blank forms are furnished to the physicians for reporting the reactions obtained after the use of antityphoid vaccine and antitoxin.

A daily report covering all the transactions is made out, enabling the clerk to readily summarize them at the end of the month.

When the results of the examination of a supposed diphtheria culture are positive, or when the attending physician requests the antitoxin for a clinical case of diphtheria, the health wardens are immediately notified so that the case may be investigated and the house placarded. Other diseases are notified to the health wardens in the same way. Results of examinations are sent to physicians by telephone as soon as they are received from the laboratory, this being followed by a report by mail on a regular form.

When samples of sputum are found positive for tuberculosis, the tuberculosis nurses are notified so that they can visit the patient, if the attending physician is willing, and give the necessary instructions.

The keeping of these reports and records and the notification to physicians is all performed by the clerk of the division.

Throat inspectors.—The two throat inspectors, one for the northern and one for the southern part of the city, collect swabbings from the throats and noses of patients who have recovered from diphtheria, or of contacts. They will, if requested, take the first culture in a supposed case of diphtheria, but this is usually done by the attending physician. They also assist in taking cultures from children attending the public schools who may have been exposed to infection. No placard can be taken down from the house where there has been a case of diphtheria, or a carrier, until one culture taken from the throat and nose of patients or contacts is negative and the house is disinfected.

Combination of state and city laboratory.—This combination would seem on theoretical grounds to be economical and satisfactory, and in fact it has worked well. The State has its own employees, blank forms, and a certain amount of necessary apparatus, and pays a rent for the use of the laboratory and fixtures, such as refrigerator, incubator, etc., of \$200 per year, and at three-month periods expenses connected with routine work, such as culture media, glassware, etc., are determined and the State pays its percentage of the cost.

If the contemplated move of the city department of health to new quarters materializes, separate storerooms will be provided for the State, a separate office, and separate fixtures.

Registration of Births and Deaths.

The work of collecting and compiling the data regarding births and deaths is not in the hands of any organized force. There are several employees concerned with it, most of whom work independently of each other and are under the immediate supervision of the commissioner or assistant commissioner of health. It would seem that the work would be accomplished with greater facility if it were coordinated under a responsible head or bureau chief.

The personnel concerned and the salaries are as follows:

| | |
|----------------------------------|----------|
| 1 chief statistician..... | \$1, 180 |
| 2 permit clerks, at \$1,000..... | 2, 000 |
| 1 index clerk..... | 900 |
| 1 statistical clerk..... | 600 |
| 1 registrar's clerk..... | 900 |
| | <hr/> |
| | 5, 580 |

Requirements of ordinances.—The following is a summary of the ordinances relating to births and deaths:

The commissioner of health is required to provide suitable books in which to register the returns made to him of the births and deaths within the city and reported cause of death. The registry of births and deaths is required to be kept under certain regulations specified by the commissioner of health, in separate books, properly indexed and accessible to the public at all times, except for purposes of commercial solicitation or private gain.

It is the duty of the attending physician to make out a death certificate within 18 hours after death when the case does not come under the notice of the coroner. This death certificate is required to be given to the undertaker and must contain the following information: Name, age, color, sex, nativity, occupation, conjugal state, duration of residence in the city, cause, date, and place of death, and duration of illness. It is the duty of the undertaker to state in such certificate the date and place of burial and to sign and deliver it to the commissioner of health within 24 hours after its receipt. Where a person has died of a contagious disease, this certificate must be delivered to the commissioner immediately upon its receipt from the physician.

Where the case comes within the notice of the coroner, he must furnish the certificate within 18 hours after death, unless a more thorough investigation requires further time. This certificate is furnished to the undertaker the same as when made out by a physician. The coroner must certify the cause of death and whether the death was due to natural causes, accident, suicide, or homicide.

No interment or disinterment or other disposition of a dead body may be made within the city without a permit from the commissioner of health. This permit must be returned to the commissioner by the sexton or other person in charge, on the Saturday next succeeding the date of burial or removal. When one permit has been given, no additional permit is necessary to remove the body from one place to another place in the same cemetery.

If any person dies without medical attendance, or if the physician in attendance refuses or neglects to furnish a certificate, the undertaker or other person acquainted with the facts so reports to the commissioner of health, who is authorized to give a certificate provided it is not a case requiring the attendance of a coroner.

If a physician or coroner refuses or neglects to furnish a certificate, there is a fine provided of \$10 for each offense; or if any undertaker, sexton, or other person refuses or neglects to perform any of his duties as required by ordinance there is a fine provided of \$20.

Every midwife and physician must keep a true register of births and must report upon the proper form a birth within four days after delivery, by name (if it shall have been given), sex, color, name and occupation of parents, date and place of birth, and signed by the midwife.

If no midwife or physician is in attendance at the birth, it is the duty of the parents to report it. For violation there is provided a fine of \$10 for each offense.

Every physician, midwife, undertaker, sexton, or superintendent of any cemetery must register by name, residence, and place of business in the book at the office of the commissioner. He must note any change of residence. For violation there is provided a fine of \$10.

The commissioner is authorized to issue a copy of a birth or death certificate, for which he must charge the sum of 50 cents. If the record can not be found, a statement of such fact is required to be made and the fee of 50 cents charged. If the applicant has not furnished sufficient data, however, to identify the record, a fee of \$1 is charged.

The commissioner accounts to the comptroller monthly for all fees received by his department from the above charges.

The record of births and deaths must contain the following information: Births—full name of child (if conferred), sex, color, full name of father, full name of mother, day, month, and year of birth, street and house number, signature of physician and residence. Deaths—full name of deceased, color, sex, age, conjugal state, occupation, birthplace, date of death, cause of death; when an infant is unnamed, name of father and mother, ward, street, number of house, and place of burial.

Necessary blanks and books must be kept on hand by the commissioner.

Nobody may remain unburied for longer than four days, or if dead of a communicable disease for longer than 24 hours, without a permit from the commissioner of health. For violation there is provided a fine of \$50.

No dead body can be transported within the city without a permit from the commissioner, and if the body is transported outside of the city the coupon attached must be signed and returned to the commissioner before 12 o'clock on the Saturday next succeeding the transportation. For violation there is provided a fine of not less than \$10 nor more than \$50.

In studying the subject it will be necessary to take it up under titles of the different employees concerned with reference to the handling and disposition of the death certificate within the department

The permit clerks.—These two clerks come under the direct supervision of the chief statistician, and their duties are to issue permits to inter the dead. One of them is on duty from 7 a. m. to 3 p. m. while the other is on duty from 3 p. m. to 11 p. m. on alternate weeks.

When the death certificate is presented to the permit clerk, he examines it to detect any missing or obscure information. If the death certificate has not been made out properly, it is returned for further information and the burial permit withheld. If it has been made out properly the permit is issued. There are six different permits in use: One where the death has occurred in the city and the body is to be buried in the city; a second especially intended for the interment of stillbirths; a third for bodies which come into the city for burial; a fourth for disinterment; a fifth where the body is to be removed from one place to another, in which case before burial can take place a regular burial permit must be obtained; and a sixth which is a transit permit for the body to be removed from the city to other places.

When bodies accompanied by a transit permit arrive from other places in the city, the undertaker in charge of the body is required to obtain a burial permit from the city before interring the body, this burial permit being issued upon presentation of the transit permit. No burial permit is issued without either a death certificate or a transit permit from another part of the city or the country. The disinterment permit is sufficient authority to reinter the body.

All these permits contain stubs which are filled out at the time of issuing the permit and retained by the city. They are kept for five years and then destroyed. All permits must be returned to the health department by the superintendent of the cemetery after they have served their purpose. They are then bound and kept as records. Before a body can be brought from the outside into the city, a transit permit must be obtained, and if secured from the city it is issued upon application of the undertaker on a special form.

For every death from a communicable disease mentioned in the ordinance a regular card of information is filled in and sent to the clerk in charge of the morbidity reports, and on the burial permit is posted a notice which is an excerpt from the ordinance relative to the burial of bodies of persons who die from communicable diseases.

In addition to this there is a daily report made to the clerk in charge of the morbidity reports of all deaths due to tuberculosis.

There is also a report made to the index clerk of all children who have died under one year of age. This is done to enable him to consult the records to find out if the birth has been reported.

A report is made to the board of supervisors of city charities of all children who have died under six months of age. This report is made so that the board may have cognizance of mothers who might be willing to suckle foundlings.

The index clerk.—The death certificates received by the permit clerks and the birth certificates which come into the department are turned over immediately to the index clerk. In the case of deaths, he enters the name of the deceased, the date of death, and the number

of the death certificate, on a card which is filed away alphabetically. In the case of birth, he enters the name of the father and the mother, the date of birth, and the number of the birth certificate, on a card which is filed away alphabetically. For purposes of quick recognition, the information is typewritten in blue ink for deaths and in red for births.

Stillbirths are reported by both a birth and a death certificate and are indexed accordingly. They are kept in a separate file.

Plural births are reported by a certificate for each child.

A separate file is kept for deaths occurring outside of the city but buried within the city limits. The index clerk, when he has properly indexed the certificates, sends them to the chief statistician, who secures the necessary information and returns them to the index clerk, who causes them to be bound in volumes of 500.

The chief statistician.—It is the duty of the chief statistician to classify the births and deaths and to secure from them certain statistical data.

The birth certificate used contains all the necessary information. Its receipt in the department is acknowledged by postal card where only one or two certificates have been received from the physician. Where a number have to be acknowledged to an institution, a card of acknowledgment is made out for each birth and all cards are inclosed in one envelope.

The number of births is tabulated on a special weekly form according to day of the week, color, legitimacy, and sex.

Upon the death certificate is noted by the statistician the ward, whether the disease has occurred within or without the city, and the number of the disease in the international classification. The certificates are then segregated so that the desired information can be obtained in the easiest manner and transcribed to the following weekly forms:

Deaths by wards and deaths in hospitals, asylums, etc.

Deaths by ages, according to sex and color.

Deaths by ages, according to social conditions.

Deaths in the city of Baltimore, according to classification, to be entered daily.

Deaths from pulmonary tuberculosis, according to age, sex, and color.

Deaths from other forms of tuberculosis, according to age, sex, and color.

Deaths from bronchitis, according to age, sex, and color.

Deaths from bronchial pneumonia, according to age, sex, and color.

Deaths from lobar pneumonia, according to age, sex, and color.

Deaths in the city of Baltimore, according to classification, age, ward, etc., with the comparative weekly mortality, being a summary of the weekly report, and to the following monthly forms:

Deaths in the city of Baltimore, according to classification, sex, and color.

Deaths from contagious and infectious diseases, by wards.

Deaths according to occupations.

Deaths according to nationality.

Interments at cemeteries.

Deaths in the city of Baltimore, being a summary of the other monthly reports.

In addition to these reports, there are special reports made weekly to the Surgeon General of the Public Health Service, to the United States public-health officer stationed in Baltimore, to the different consuls of the city, and a list (weekly and monthly) of certain morbidity and mortality statistics for the newspapers of the city of Baltimore.

The statistical clerk.—The duties of the statistical clerk are to secure certain special information from the death certificates. She receives the death certificates from the statistician. She first classifies the deaths of the month by wards and summarizes this information at the end of the month on another sheet.

Cards are then made out for filing, containing certain special information relative to deaths from heart disease, intestinal diseases, cancer, inanition and marasmus, tuberculosis, measles, typhoid fever, whooping cough, scarlet fever, broncho-pneumonia, pneumonia, and Bright's disease. From these cards the information is transferred to different forms arranged for the notation of data relating to occupation, sex, and age; sex, color, and ward, and sex and color. In the case, however, of marasmus, inanition, and intestinal diseases, the information is transferred to a somewhat different form, in that it covers only the ages up to 5 years according to wards. A special form is used for reporting tuberculosis and cancer, and the last forms have a general summary of information at the end of the year relative to population, deaths, death rates, etc.

The statistical clerk is also the librarian of the department, and has under her charge the cataloguing of books and magazines which are not kept in the special divisions or bureaus of the health department. The library is catalogued according to subject, author, and title.

The registrar's clerk.—The duties of this clerk are to issue transcripts of death and birth certificates to persons applying for the same. A special application blank is required for a copy of a birth certificate and another for a copy of a death certificate, and a special form is used for transcribing the records, one for births and one for deaths. There is a good deal of correspondence in connection with the work of this clerk for the reason that many people request a record without giving the necessary information, and their request has to be returned. A special form is used for this purpose, which also quotes the ordinance regulating the issuance of transcripts.

It is difficult or impossible to get a record of a birth or death before the year 1875, for the reason that no records were kept before that date, and even to this day, while probably all the deaths are being reported, there are many births that are never notified to the health department.

The child-labor laws of the State prohibit a child under 10 years of age from being employed in any industry, and in order to secure

employment for a child, a transcript of birth certificate must be presented to the bureau of statistics and information showing that it is over the required age. This certificate is obtained from the health department, and according to law no charge is made for the transcript. A complete record is kept in a book of the transcripts issued, including the amount collected and other information. This book is kept properly indexed by the registrar's clerk.

None of the clerks employed in tabulating these statistics can be considered in any way an expert in statistics. The assistant commissioner, who has himself made a special study of the subject, is prevented from giving his attention to the matter by the numerous details relating to other subjects with which he is continually overburdened. It is certainly safe to say that this statistical work should be performed in a division in charge of a division chief, an expert in statistics. Tabulating machines should be installed. With these the work that is now being performed by several could very readily be done by one more promptly and with more accuracy. There would seem to be no reason why the city should not make use of the tabulating machines which are at present in the State department of health.

Tenement-House Inspection.

The work of tenement-house inspection was organized by a man who had studied the system used in New York and adapted it to the conditions in Baltimore city. After getting the work into good running order he lost his position for political reasons. This is simply an indication of how difficult it is to do things properly when politics dominate a health situation.

The personnel and their respective salaries at present are as follows:

| | |
|-----------------------------|---------|
| 1 chief inspector..... | \$1,200 |
| 2 inspectors, at \$900..... | 1,800 |
| | <hr/> |
| | 3,000 |

Requirements of ordinances.—The ordinances relating to tenement-house inspection are summarized as follows:

The mayor and city council of Baltimore are authorized to enact ordinances regulating the construction, care, use, and management of tenement houses, lodging houses, and cellars.

Under the charter a tenement house is defined as a house, building or portion thereof, which is rented, leased, or hired out to be occupied as the house or residence of three or more families living independently of one another, and doing their own cooking upon the premises, or by more than two families upon a floor so living and cooking but having a common right in the halls, stairways, water-closets or privies, or some of them.

A lodging house is defined as a house or building or portion thereof in which persons are harbored or received or lodged for hire for a single night, or for less than a week at one time, or any part of which is let for any person to sleep in for any time less than a week, or in which free lodgings are habitually provided for and given to more than five persons who are not permanent occupants thereof.

A cellar is defined as a basement or lower story of any building or house of which one-half or more of the height from the floor to the ceiling is below the level of the street adjoining.

All tenement or lodging houses must be kept clean and free from any accumulation of filth, garbage, or other matter; the rooms, passages, privies, etc., must be thoroughly cleansed; walls and ceilings whitewashed at least once every year. They must be registered with the commissioner of health.

For violation there is provided a fine of \$20 and a further fine of \$5 for every day thereafter that the ordinance is not complied with.

Methods, reports, and records.—The tenement-house problem is probably not as serious in Baltimore as it is in some of the other large cities, and resolves itself more into a question of insanitary slum property, of which Baltimore has its share. Even this is not as serious, notwithstanding the age of the city, as it is for instance in some of the English cities where enormous amounts of money have been spent in the demolition of such property and the erection of modern sanitary houses for the poor. The insanitary court is not noticeable in Baltimore as it is in some other cities, although a few are in existence.

Supervision over tenement houses includes, according to the definition of the ordinance, apartment houses. Lodging houses are also subject to supervision. To build or remodel a house to be used as a tenement house the owner must register in the department of health.

In the case of all tenement houses a card is made out giving full information relative to number of apartments on each floor, number of families, rooms, people, sanitary arrangements, light, ventilation, etc. A separate card is used for lodging houses. These are permanent records.

Four sets of notices are in use—one to notify the tenant that his house is in a filthy condition and must be cleaned; one to notify the proper person that a nuisance exists and must be abated; one to notify the proper person that the house must be connected with the sanitary sewer and certain plumbing fixtures installed. These two latter notices are delivered by the police officer and a receipt taken. The fourth notice is a legal proceeding notice in case previous notices are not complied with.

When a notice is sent relative to a nuisance in a tenement house or lodging house, it is entered on a filing card and placed in what might be called a "daily reminder" file until the nuisance is abated. Each notice is given a number. This number is entered on another card which is a permanent record of notice served.

Some of the tenement houses and lodging houses of the city were inspected and except that in many cases they were old buildings, and dirty on account of the filthy habits of the tenants, they were not bad as regards light, ventilation, and in most instances toilet facilities.

The work of installing modern toilets and making sewer connections is progressing rapidly; in fact in only one instance were the tenants of the house depending upon an old filthy drop closet. In only one tenement house inspected were bathtubs observed, and in many cases they seemed to be utilized as wood bins or laundry tubs rather than for the purpose for which they were intended.

There are about 2,700 tenement houses, including apartment houses and lodging houses, within the city, and an effort is made to inspect each one of them at least twice a year. Where notices are issued to abate nuisances or install toilet arrangements they are frequently re-inspected until the matter has been attended to. In ordering toilets it is usually estimated that there shall be one for every six people or at least one for every two families. To determine overcrowding in tenement houses 400 cubic feet of air space is allowed for each adult and 200 cubic feet for each child in the sleeping rooms, while for lodging houses a minimum of 700 cubic feet is required for each individual.

There is no ordinance requiring the installation of bathtubs or other washing facilities, and the ordinance does not prohibit the use of dark rooms for sleeping purposes, although an effort is always made to prevent this, which is frequently successful. In fact, the construction of the buildings in the slum districts of the city is such that light and ventilation are good as a rule.

The work of tenement-house inspection should come under a bureau of sanitation if such bureau were in existence.

Medical Inspection of School Children.

The medical inspection of school children was begun in February, 1905, with three nurses and two physicians.

It is subject to the same criticism as much of the other work of the city department of health, in that each physician works independently of the other, there being no organization under any direct head, except the assistant commissioner of health, who, as has been said before, is overburdened with a multiplicity of details.

The personnel and their respective salaries engaged in this work at present are as follows:

| | |
|---|--------------|
| 5 school medical inspectors, at \$600 | \$3, 000 |
| 5 school nurses, at \$600..... | 3, 000 |
| | <hr/> 6, 000 |

Methods of procedure.—A school nurse works under each school physician. Each physician has a stated number of schools to inspect, depending on the proximity of the different schools to each other. This gives some physicians as high as 22 schools. The school year is from September 15 until about June 15. The school physicians work

from October 1 to June 1. They do not begin at the beginning of the school year, for the reason that the pupils have not all been enrolled until October 1.

There is no special room set aside for the work, the principal's office or sometimes the teachers' resting room being utilized for the purpose. The records are kept in the schools to which they belong. With the present force it is possible to make but two examinations of each child during the year, and only children who have shown some defects during a first examination are examined the second time.

There are in the city of Baltimore 111 day schools, 26 night schools, 6 summer vacation schools, and 1 parental school, with a total enrollment of 83,937 pupils and an average daily attendance as follows:

| | |
|------------------------------|--------|
| Day schools..... | 57,263 |
| Night schools..... | 3,188 |
| Summer vacation schools..... | 924 |

Every child admitted to the first four grades is given an examination card, on which is entered the school number, the room number, the class, name, age, address, etc. This card is kept throughout the child's attendance at school, and on the reverse side is entered, by years, any diagnosis made, whether treatment was ordered, whether a cure was effected, whether treatment was secured, or whether there was no treatment.

The examination is rather cursory unless it is evident that a more thorough examination is necessary, as, for instance, if tuberculosis is suspected. The condition of the throat, nose, teeth, conjunctiva, ears, skin, and hair is always observed and the necessity for vaccination.

Where the child is in need of some medical attention a card is addressed to the family, giving the diagnosis and suggesting that they consult the family physician or send the child to a dispensary. If this is done, the card is signed by the physician and returned to the school-teacher, who in turn hands it over to the school nurse. At the time this card is sent to the family, a card is also inclosed, which may be signed by the parents of the child and is authority for the school nurse to take the child to some institution for treatment.

No treatment is given by the school physician, whose duties are merely to make the examination and determine that some pathological trouble exists. Where it would be advisable to have a specialist make the diagnosis, an effort is made to get the child to a free dispensary for the purpose.

No special examination is made of the eyesight, but where it is noticeable that any child in the course of its studies is defective in this respect an effort is made to have it attend the proper dispensary or see the family physician. Children suffering from scabies are excluded. Glasses may be furnished by the federated charities.

Children suffering from pediculosis with live pediculi are excluded from school and a notice in four languages is sent to the parents relative to the treatment.

Children suffering from the communicable diseases—diphtheria, scarlet fever, measles, chicken-pox, or other children's diseases—are excluded as well as contacts. The teachers of the school are kept informed as to these contacts by the health department, which submits to each teacher a list made up from the health wardens' reports. In addition to this the principal is immediately notified by postal card when a communicable disease occurs in a school child. Diphtheria and scarlet fever contacts can not return to school without a certificate from the health department; in other diseases a certificate from the attending physician is sufficient.

In the case of tuberculosis an effort is made, if the parents will permit, to secure admission to a sanatorium, or if an incipient case the pupil is enrolled in the open-air school. As has been said before, however, the two schools intended for this purpose are not yet ready to be used.

While no case of trachoma has been reported, this would necessitate exclusion from school.

As is the case in all work of this character, the school nurse is probably the most important factor in the system of inspection of school children. It is her duty to keep in close touch with the children, not only in the school but out of it. It falls upon her to visit the child at its home, give advice, and secure the consent of the parents to have the child given the proper treatment, and to take the child to a dispensary where such treatment can be administered. She it is who becomes the real instructor in the right way of living during her visits to the pupils' homes. Her assistance is also valuable to the doctor during his examinations. It falls upon her to keep many of the records.

The work done by the school nurse is so important that if funds would allow there should be a nurse for every 1,000 or, at the most, 1,500 pupils. She should be made a member of the teaching staff and should have constant supervision over the health and personal hygiene of the child both at school and at home. She should be especially trained in sanitary science and should be required to teach it in the school. Certainly such a course of instruction would be far superior to the subject of hygiene and physiology as generally taught in public schools at present.

Control of Nuisances.

Complaint clerk.—The control of nuisances is supervised through an office of the department in charge of one employee known as the "complaint clerk," who receives \$900 per year. His duties are to

receive complaints, to distribute them among the health wardens for investigation and action, and to keep the necessary check on them to see that they have been attended to properly. He also reports the time of arrival of health wardens, who are required to come to the department at 1 o'clock each day and remain about one hour.

Requirements of ordinances.—The ordinances relating to nuisances are summarized as follows:

It is the duty of the commissioner of health to inspect lots, houses, suspected cellars, premises, possessions, streets, lanes, and alleys within the city, and if they are in a condition liable to create a nuisance and endanger the health of the citizens, it is his duty to notify the proper persons and cause the said nuisance to be removed and abated within a specified time. If the nuisance is not abated after notification, the commissioner of health has the power to do so at the expense of the owner or occupant, and this expense may be recovered by suit, if necessary. If a notice to abate a nuisance is neglected, there is a fine provided of not less than \$10 nor more than \$100.

If no agent, occupant, or owner can be found, the commissioner of health is authorized, after giving five days' notice in one or more daily newspapers in the city, to have the nuisance abated at the expense of the city, and this expense is recovered from the owner when his whereabouts are ascertained.

When the commissioner of health, in proceeding to abate nuisances, finds that the nuisance originates in an adjoining lot, he must order the proper person to remove that nuisance, and for failure to comply there is a fine of \$20.

If no owner, agent, or occupant of such lot can be found, the notice to abate is required to be posted on the lot or premises to which it refers.

If the expense incurred in removing a nuisance has not been collected, including the cost of advertising, it remains a lien against the entire lot or premises, and after due course the property is required to be sold under due legal process.

If the property is owned by a person outside of the State of Maryland, the commissioner, before selling same, must give notice of such sale in three of the daily newspapers of the city, with a particular description of the property.

When property is under the control of an executor, administrator, etc., the same procedure must be used in the abatement of nuisances against such administrator as if he were the owner.

No provision of any ordinance may be considered to prohibit dealers in bones from purchasing the same and depositing them on their premises, provided that green bones can not be kept for longer than 12 hours and that no offensive bones may be so deposited.

Where the commissioner of health believes that any nuisance exists in a cellar, he may demand entry therein in daytime. If entry is refused there is a fine provided of \$20.

The commissioner of health has the power to require that cellars and vacancies under stores, etc., be filled up with some materials and paved with brick or stone, and the lot adjoining may also be ordered filled to the level of the street to prevent the lodgment of water on the premises.

All dead animals must be removed within 12 hours after notice from the commissioner, and dead horses, mules, cattle, sheep, or hogs, must be removed in covered or in closed vans or wagons. For violation there is a fine imposed of not exceeding \$20.

No manure or nuisance of any kind can be deposited on any lot within the city without the consent of the owners or occupants of the lots adjoining. For violation there is a fine of \$5 and a further fine of \$5 for each day such nuisance may remain.

No person may deposit on his own lot or premises the cleanings of any slaughterhouse, fish dealer's house or yards, or any other dirt or filth, nor receive nor deposit on his premises any dead animal or green bones, fish, or crabs, or other offensive articles. A penalty for violation of not less than \$5 nor more than \$20 is provided.

No person may remove any of the articles mentioned to any other premises within the city limits. For violation there is a fine of \$5.

No person may bring from without the city any materials mentioned above and deposit the same on any premises within the city. For violation there is a fine of \$5.

No oyster or clam shells can be dumped within the corporate limits without permission from the commissioner. Oyster packing establishments or oyster dealers may deposit such shells on their property. For violation there is a fine provided of \$10 for each day.

Oyster shells may not be stored on premises during the months of June, July, and August. For violation there is provided a fine of \$10 for each day.

Wharves and low grounds must not be filled with wood shavings or vegetable matter. For violation there is a fine provided of not exceeding \$50.

The chimney or smokestack of the furnaces in the city hall or city hall annex or courthouse may not be permitted to emit dense or black smoke.

The chimneys from the furnaces of any hotel, office building, apartment house, theater, place of public assembly, or store, or dwelling, within the city may not be permitted to emit dense or black smoke, except in the case of furnaces used for heating greenhouses. For violation there is provided a fine of \$25 and an additional sum of \$10 for every day during which the violation continues.

It is the duty of the commissioner to see that these ordinances against smoke nuisances are enforced.

When any cow or horse stable becomes in such condition that filth and stench from it are offensive to neighbors, it must be declared a nuisance, and for failure to abate there is provided a fine of \$5 for each day.

The following are considered offensive trades or businesses and their carrying on is prohibited or restricted by the municipal ordinances:

Manufacturing, grinding, or preparing any chemical or mechanical preparation for roofing or other purposes.

Distilleries for the manufacture of copal varnish, or boiling or grinding of bones.

Distillation of spirits of turpentine or varnish, or the manufacture of earthenware or stoneware.

The manufacture of soap or candles, the pulverizing of charcoal, the manufacture of red or yellow ocher or other kinds of earth of which red or yellow paint is made.

The manufacture of oil of vitriol, nitric acid, muriatic acid, crude ammonia, ivory black, alum, chloride of lime, pigments of lead, or other manufacture, where it is necessary to burn horn, blood, bones, or other animal substances.

The manufacture of cotton wadding, cotton laps or bats.

The molding of clay or any other substance for the manufacture of bricks or tiles.

Poudrette works, glue factories, or establishments for the purpose of rendering grease, dead animals, animal offal, or stockyards for receiving, feeding, and offering for sale live stock.

For violations of the ordinance covering the subject of offensive trades, penalties are provided.

No person except those authorized, may convey any garbage, house offal, etc., through the streets of the city without first obtaining a permit and then only in accordance with the terms of the permit. The commissioner of health may grant this permit in his discretion and may revoke the same. For violation there is a fine of \$2 for each offense.

No earth, dirt, sand, ashes, garbage, gravel, rocks, or refuse matter may be dumped on any private property without permission from the owners or agents. For violation there is provided a fine of \$5.

No garbage or refuse may be burned on or in the vicinity of any of the ash or garbage dumps in the city. For violation there is a fine of \$5.

If a complaint is made to the commissioner by six property holders or heads of families within 600 feet of a slaughterhouse that such slaughterhouse is a nuisance, it

shall be his duty to examine the place and if the complaint is well founded to report to the mayor. If the mayor agrees with the commissioner and it was erected with the understanding that the mayor could order its removal, he must immediately give such notice. If erected without such understanding, the nuisance must be proceeded against by law.

No slaughterhouse or hide house can be erected within the city limits. For violation there is provided a fine of \$200 and a penalty of \$100 for each and every month until removed out of the city limits.

No hogpen can be maintained within the city limits under a penalty of not less than \$1 nor more than \$5 for each day and for each hog. This does not apply to hogs that are kept for sale if they are not kept for such purpose for a period longer than 10 days.

By securing a permit from the commissioner a victualler may keep on his slaughterhouse premises a sufficient number of hogs to consume the offal from the slaughterhouse.

Such permit must not be given if, in the judgment of the commissioner, it will create a nuisance, and the permit is good for 12 months unless sooner revoked. For keeping hogs upon premises without a permit a fine is provided of \$20 and \$5 for every day such violation is continued.

Where any person refuses to comply with an order or notice of the commissioner and no special fine is already provided, there is a fine provided of \$20 for each offense and \$5 for every day that the refusal shall continue.

All fines, etc., incurred by violation of the ordinance must be recovered as other fines under the city ordinance and money so collected is required to be paid to the comptroller.

Complaints and notices.—Complaints are received from the public in person, through the mail, or by telephone. In this way about 48 or 50 complaints are received per day. Other complaints, of which there is an average of 92 per day, are received from the police department. The first are entered on three different forms, two of which are given to the health warden and one is retained in the book as a stub. Of the two issued to the health warden, one is returned properly made out when the notice to abate the nuisance is issued, while the other is returned when the nuisance is abated. These are filed away, a record being made on the stub of any information given by the health warden, the date on which the notice of the nuisance is referred to him, and the action taken.

Notices to abate nuisances are made out by the health warden after an investigation, on a regular form, of which a retained copy is kept as a stub. Three notices to abate are in use, one for general complaints, one for insanitary privies, and a third, which is called a legal proceeding notice, to be sent when other notices have failed. Where the health warden can not determine the cause of the nuisance, as, for instance, in flooded cellars, the matter is turned over to the plumbing division for investigation. The policemen submit to their department every day a note made out on a special form of nuisances occurring in their districts; these are summarized by wards at the end of the day on a special form by a clerk of the police department and transmitted to the health department. The health department in

this case makes no investigation, but issues an order to abate the nuisance and the matter is then followed up by the police department.

Where the health warden has investigated the nuisance, he follows it up to the end and swears out the warrant and appears in court against the defendant in case prosecution is brought. In the other case the police department appears against the defendant, only calling in the health warden as a witness. A complaint book is kept for each health warden, or one for each ward in the city.

All notices to abate a nuisance are served by the police officers upon the owner, authorized agent, or the tenant. A receipt for the same is taken and transmitted to the health department, where it is attached to the stub in the health warden's notice book. This is used as proof in court that the notice was served on the proper person. Where nuisances are caused by collections of rubbish in back yards or vacant lots, cellars, etc., the notice to abate is served on the tenant. Where the nuisance is due to some faulty fixtures in the house, such as leaky plumbing fixtures, the notice is served on the owner or the authorized agent of the owner.

The abatement of nuisances is of great annoyance to a health department, and too often of very little importance from the standpoint of public health. Their investigation and correction certainly do not seem to be appropriate work for a physician, but for a sanitary inspector, and should come under the authority of a bureau of sanitation in the health department, which in this particular city might be the plumbing division.

A great many nuisances of which people complain have reference to defective plumbing and drainage. These and all others could be readily handled by the same inspectors from the same division or bureau. As a matter of fact, while the health department should not lose its power to abate nuisances, these matters should be controlled by the police department, and usually the entire action should be taken by its officers without referring to the health department. In fact the health department has recently arranged with the police department to have the police officers attend to a good deal of this work regularly and systematically and so far their work has proved valuable and it looks as if much would be accomplished.

There are certain nuisances which have a direct bearing on the transmission of the communicable or preventable diseases, such as collections of manure, which breed flies, and stagnant water, which breeds mosquitoes. These nuisances should, of course, receive the attention of the health department.

With a properly organized bureau of sanitation within the health department, to include plumbing inspection, disposal of garbage, rubbish, and the like, the abatement of nuisances could very well be handled as a routine matter with the force organized for other purposes.

Inspection of Plumbing.

Plumbing inspection is carried on through a well-organized division which was established in 1884 when the first plumbing ordinance was put into effect. At present its personnel and their respective salaries are as follows:

| | |
|--|----------|
| 1 chief inspector (chief of the division)..... | \$1, 600 |
| 12 plumbing inspectors, at \$900..... | 10, 800 |
| 3 sanitary inspectors, at \$900..... | 2, 700 |
| 1 chief clerk..... | 1, 000 |
| 6 clerks, at \$900..... | 5, 400 |
| 1 stenographer..... | 900 |
| | <hr/> |
| | 22, 400 |

Duties of the plumbing division.—The duties of the plumbing division are concerned with the supervision of the work of plumbers, including the installation of plumbing fixtures, sewer connections, and abatement of nuisances due to defective drainage or faulty plumbing.

Requirements of ordinances.—These requirements will not be gone into in detail. Suffice it to say that they cover the construction and maintenance of privies within the city limits, the removal of night soil, the requirements for master plumbers, the kind of pipes and fixtures that may be used, etc.

Methods of procedure.—Until very recently Baltimore was far behind other cities in respect to adequate disposal of sewage, but in the last few years, the city having issued bonds to the amount of \$20,000,000 for the purpose, great strides have been made in improving conditions by building a modern sewerage system. At the present time all main trunk sewers are completed, about two-thirds of the city is provided with lateral sewers, and 36,000 premises now have sewer connections. In fact the work has progressed so rapidly in this latter respect that the division of plumbing, due to a lack of employees, has not been able to handle its work, and at present there are about 14,000 final inspections to be made. With the present force it is a physical impossibility to keep up with the work.

The construction of sewers is in the hands of the sewerage commission. The jurisdiction of the plumbing division of the department starts at the lot line, where the jurisdiction of the sewerage commission ends.

Only a master plumber is entitled to undertake contracts to do plumbing. To become a master plumber, he must secure a license from the State board of practical plumbing examiners, who are also authorized to license journeymen plumbers. The law requiring licensing in this way also provides for the fining of plumbers, and the board is empowered to revoke a license.

Before work can be commenced the plumber makes application to the plumbing division for a permit, giving all necessary information and submitting plans and a letter showing that he is authorized to do the work. A permit is then issued and given a serial number and full information entered in a loose-leaf ledger. When the job is completed the plumbing division is notified and a final inspection made. At this inspection no special test is applied.

When a sewer is ready to have connections made householders are notified that they must connect within 30 days; if then no steps are taken to comply, a second notice is sent, giving them an extension of 10 days. If no attention is paid to this final notice a warrant is obtained, and if found guilty by the court they are liable to a fine of \$5 for every day's delay. The health department also has authority to make sewer connections and charge the expense to the property owner.

A notice is sent to the property owners stating that according to a recent ordinance they may place the soil, waste, and vent pipes on the outside of the building, but that by doing so the pipes may freeze and burst in cold weather. If they desire this done they must notify the health department.

The plumber must notify the health department when he will commence work. Blue prints of the different sewer districts of the city are obtained from the sewerage commission and are kept on file in the plumbing division for the purpose of keeping accurate records of all connections to the sanitary sewer.

There are a number of different forms in use covering the different conditions which come within the jurisdiction of the plumbing division relative to sewer connections, installation of plumbing fixtures, nuisances, drainage, and the like.

The system of keeping records seems to be excellent, and at the same time not too complicated.

Sewerage disposal plant.—On account of the amount of sewage flowing into the Baltimore Harbor producing nuisance and threatening to cause a pollution of the oyster beds, it was decided both for public health and economic reasons to instal a sewage disposal plant. The plant is practically completed, but provision has been made for its enlargement to provide for normal growth of the city.

The sewage collected in the low-lying portions of the city has to be pumped to a level where it will flow by gravity to the disposal plant. Here the sewage enters a concrete tank where it passes through a coarse screen. From here it passes through a meter, to determine the rate of flow, then to a sedimentation reservoir of such size that it takes about six hours for any particular portion to pass through. In this reservoir the heavier material sinks to the bottom, the supernatant liquid portion is permitted to flow out into a main channel, and the

sludge pumped into concrete tanks to undergo digestion. This process is allowed to take place for a month or more, and the contents after digestion are flushed out onto sand beds and permitted to dry.

The liquid portion that has been passed into the main channel goes through a fine screen where particles which have not sunk to the bottom in the first reservoir are caught and passed back to the digestion tanks. The portion which passes through the screen escapes through jets placed at regular intervals onto a percolating bed composed of 7 feet of coarse crushed rock. The liquid thrown out by the jet passes through this layer of rock and is collected in a subsoil channel and flows out through a main effluent pipe emptying into the Back River. This outflow furnishes sufficient power to run an electric-light plant.

It is claimed that this plant gives an efficiency of 95 per cent and so far has cost about \$2,000,000.

Maritime Quarantine.

The management of the quarantine station and the inspection of incoming vessels are in immediate charge of an assistant commissioner of health, who acts as quarantine officer and resides at the quarantine station.

Requirements of ordinances.—A summary of the city ordinances relating to quarantine is as follows:

The powers and duties of the assistant commissioner of health, acting as quarantine hospital physician, are:

To attend at the office of the commissioner of health when requested.

To inform the commissioner of health of anything demanding the attention of the health department.

To advise with the commissioner of health on all subjects, particularly pertaining to the sanitary condition of the port.

To collect, under the direction of the commissioner, all money coming due from patients of every class and from immigrants and others received into the hospital, and to pay over said money to the city registrar monthly, with a report as to the number of patients under treatment at the hospital.

To make a monthly report to the commissioner of health relating to the affairs of the hospital, number of inmates, by whose order received, and by whom the expenses are borne.

To employ, with the consent and approval of the commissioner, such persons as may be necessary to carry on the duties of the quarantine hospital.

To attend properly to all messages or communications sent to him.

To carry into execution the quarantine laws and regulations.

All vessels arriving between the 30th day of April and the 1st day of November, and such other times as the commissioner of health may direct, must remain in the quarantine grounds until passed. These quarantine grounds are specified in the city ordinance.

Vessels must be boarded by the quarantine hospital physician as soon as practicable after their arrival at the quarantine grounds, between sunrise and sunset.

The quarantine hospital physician must examine into the health of the personnel of the vessel, its passengers, condition of cargo, crew, and vessel as to cleanliness, presence of disease, or any other facts of interest to health.

If deemed necessary he may require the necessary disinfection or cleansing of the vessel, the expense of which is borne by the vessel. No vessel can be removed from quarantine without the written permission of the quarantine hospital physician. For any violation there is provided a fine of \$500 and a further fine of \$50 for every hour the ship or vessel may remain in any position in violation hereof.

After the cargo is discharged, if deemed necessary, the quarantine hospital physician may order moved any vessel from the wharf into the stream to be thoroughly cleansed and ventilated. For violation there is provided a fine of \$100 and \$20 for every hour thereafter during which said disobedience shall continue. When any vessel arrives with smallpox, varioloid, or a suspicious communicable disease aboard which might be smallpox or any other infectious or contagious disease, or where any such disease has appeared during the voyage, the vessel shall be brought to quarantine and can not depart until a permit is granted by the quarantine physician. It is also unlawful to land any person suffering from a suspicious disease without written permission from the quarantine hospital physician.

Officials of the vessel must make full disclosure of all circumstances that they know of in relation to the health of the personnel or passengers, and must answer all questions asked them by the quarantine hospital physician. For violation there is provided a fine of \$5.

The commissioner of health has the authority to receive into the quarantine hospital any person from Baltimore or other port of the State affected with a communicable disease dangerous to the community.

It is unlawful to bring into the city any damaged coffee, hides, rice, or other article liable to produce disease, under a penalty of \$100.

The commissioner may exempt from quarantine inspection steam vessels entering the city and coming from any port in the United States north of Cape Henry; such exemption to remain in force until countermanded, or unless a dangerous communicable disease be present on the vessel.

Vessels arriving from ports north of Cape Henry, free from epidemic or contagious diseases, and all cargoes from such ports, are not subject to these quarantine regulations unless so specified by the commissioner.

The inspection of vessels is made in daylight, as soon as possible after entry into the quarantine grounds. Cases of smallpox, varioloid, or other communicable diseases found aboard are sent to the quarantine hospital. Necessary disinfection of articles, crew, and passengers is performed under the supervision of the quarantine hospital physician, and no communication may take place between detained persons and the citizens of Baltimore until all necessary means have been taken to prevent the spread of the disease. For violation there is provided a fine of \$20.

The cost of disinfection is charged against the vessel. The cost of maintenance of passengers, whether detained aboard ship or removed on shore, failing to maintain themselves, must be provided for by the master of the vessel, or charged against the vessel; and no vessel may leave quarantine until such expense has been reimbursed.

Any person in charge of a vessel detained at quarantine who refuses to comply with the requirements is liable to pay the sum of \$20 for every such refusal or neglect, and the further sum of \$20 for every hour thereafter during which his disobedience continues.

Any person coming ashore from a detained vessel without permission is required to pay the sum of \$50, and any person leaving the hospital grounds without permission must pay the sum of \$50.

Any person who goes aboard a vessel detained in quarantine is liable to a fine of \$20.

If any communicable disease appears aboard a vessel while at a wharf or in the harbor at any season of the year, the commissioner of health is required to order the vessel quarantined, and necessary precautions must be taken. For violation there is provided a sum of \$100 and the further sum of \$20 for every hour thereafter during which such disobedience continues.

For inspection of vessels, whether at quarantine or elsewhere, there are provided the following fees to be paid by the commander, captain, owner, or consignee of the vessel:

For vessels not exceeding 200 tons register measurement, \$2 for each and every voyage.

For vessels over and above 200 tons, 1 cent a ton for each and every voyage.

The quarantine hospital physician is authorized and directed to charge each patient over 15 years of age 50 cents a day and 25 cents for each person under 15 years of age, except infants; no charge is made for infants. If the patient does not pay, the master, owner, or consignee of the vessel is answerable. The quarantine hospital physician, through the commissioner, obtains the necessary supplies for the support of the hospital.

When the quarantine hospital physician finds it necessary to remove goods, baggage, or bedding from the ship, he must keep them safe from injury or depredation and return them to the ship when disinfected. If the patients owning them are detained in the hospital, they are delivered to their owners when discharged.

The quarantine hospital physician is authorized, when necessary, to make all necessary vaccinations on vessels detained at quarantine, and to charge 25 cents for each person vaccinated, and if it is necessary for the quarantine hospital physician, where a person is not in the hospital but desires the professional attendance of the quarantine hospital physician, he is authorized to charge 50 cents per day for each and every person so attended. If the person does not pay the charge, the owner or consignee of the vessel is answerable for it. Moneys so collected are paid to the city registrar and placed to the credit of the quarantine hospital.

It is the duty of the harbor master to report any violation of the quarantine regulations to the commissioner of health who is required to enforce the penalties. All money so collected is paid to the city registrar who places the same to the credit of the quarantine hospital.

Quarantine station.—The quarantine station is very well located on the Patapsco River about 10 miles below Baltimore. It comprises a small boarding tug, a gasoline launch, a wharf, a brick building containing disinfectant chamber, boiler and pump; a wooden building for isolation of contacts, a wooden hospital, a small building containing an office and a bedroom for the junior medical officer, a residence for the chief quarantine officer, a stable and a small structure which was built and used in the past for isolating a case of leprosy.

It is not the intention to go into detail relative to this station, but it may be said in general that the buildings are all old (the station having been established since 1881), and badly in need of repair, not to mention a thorough cleaning. Toilet facilities are poor. The large building for contacts, for instance, has but two bathrooms, each containing one tub, instead of shower baths and two toilets, and the fixtures in some instances freeze in cold weather. The heating facilities are obsolete and inadequate, and judging from the appearance of the place the employees are more or less worthless. The station shows a great lack of care and discipline, not, it is to be believed, due to the shortcomings of the officer in charge, but to the political conditions of employment and character of attendants. It also seems to be the policy of the city to fail to appropriate money for the care and preservation of the property of the quarantine station, including the launch. The furnishings are all very poor and old.

The city itself might not be wise in relinquishing the control of this station, until a detention camp is provided for its smallpox cases, since there is now no other place to put such cases. As a matter of fact should the Federal Government take over this station, it would be well to continue to care for the smallpox patients of Baltimore for some remuneration, inasmuch as it would make available material with which to instruct the officers of the United States Public Health Service in the diagnosis and handling of that important communicable disease. If the transfer ever should go into effect, the money paid over to the city should go to the health department, and should be used as a fund to prevent the spread of communicable diseases, especially smallpox. If the above plan were adopted there would be little need for a detention camp in which to put smallpox cases.

At the present time the maintenance of a maritime quarantine station is not the legitimate function of the city, in fact there are only two in existence so maintained, namely, the one at Baltimore and the one at Boston. This function should properly be exercised by the Federal Government.

It is understood, however, that the business men of the community hesitate to have the city relinquish control of this station until Boston, a competitive city, does the same. This attitude is probably due to the belief on their part that the shipping interests of the city would be better looked after by a local than a Federal officer. This view is erroneous, however, and the business men would no doubt be as well satisfied with Federal control as with the city control after it had once been established.

The Secretary's Office.

The secretary of the department is actually the auditor for the health department, and is principally concerned in purchasing supplies, keeping memorandum accounts, and transmitting bills for payment to the comptroller. He also assumes charge of the department in the absence of the commissioner and the assistant commissioner.

Requisitions and supplies.—The only printing which is paid for by the department is the bill for the annual report, for which there is a special appropriation. All other printed matter is furnished by the city librarian, whose duty it is to get out the proper contracts, secure the necessary money from the board of estimates, and furnish printed matter as required. An estimate of what will be necessary during the coming year is furnished to the librarian by the department of health, and from time to time during the year requisition is made on his office for supplies.

Supplies in general use, such as antitoxin, vaccine virus, coal, groceries for the quarantine station, and the like, are contracted for

at the beginning of each year. When the health department needs such supplies, an order is made out by the secretary in triplicate on the firm that has been awarded the contract. The triplicate is kept by him; the duplicate and original sent to the dealer. The original is retained by the dealer and the duplicate returned to the health department. When these supplies are furnished, the secretary does not check the goods sent with the order; he makes out the necessary warrant which is signed by the commissioner and transmitted at the end of the month with the duplicate order to the comptroller for payment. All bills are paid by the comptroller by check by mail, except in amounts under \$10 bought in the city of Baltimore, which are paid in cash.

Employees of the department are paid twice a month. Pay rolls are made out and signed, and transmitted to the comptroller. A check for the entire amount is returned to the health department, made out in favor of the commissioner of health and the secretary. This fund is deposited in the bank and checked against in paying off the employees.

No special requisition forms are used by the different employees of the department, nor are bills checked by the employees who have ordered the supplies before they are paid. Several books are kept by the secretary, enabling him to determine amounts spent from each appropriation. It is difficult, however, to determine the exact expense of any one division or any particular piece of work. For instance, car fares of certain divisions are lumped together. This applies to other items as well. Entries are frequently made under the name of the dealer, so that it is necessary to go back over many bills to find out what articles were bought and to what division they went. From the standpoint of the comptroller, the books kept in the department are quite satisfactory; but from the standpoint of the public health officer, who wishes to determine the exact cost of any division or bureau, the books would not be satisfactory.

The commissioner of health should receive a monthly statement showing the exact financial standing of every division or bureau of this department, and should be able to call at any time for such a statement, and the books should be kept so that the information required by the commissioner could be secured without any difficulty.

A division should be formed to be called the financial and property division, and the secretary, on account of his present work, could be very readily made the chief of this division or bureau. Special forms should be devised for the different divisions or bureau chiefs to requisition for supplies needed by them, and the bills therefor should not be paid until checked by the bureau or division chiefs showing that the articles have been received. No supplies should be purchased until the requisition is signed by the chief of the bureau or division and approved by the commissioner.

The secretary has had, and in fact still has, a certain amount of independence which is inconsistent with a properly organized department where the head of that department or his immediate assistant is supposed to know what is going on. Formerly it was customary for an employee who wished to leave early, or not to make his appearance at all, to secure permission from the secretary, and this plan which at times is still followed, is not conducive to good discipline nor thorough work.

Where there is a bureau chief or chief of division, he should be made responsible for the absence of his employees, and without such a bureau chief they should secure permission from the assistant commissioner of health.

Due to the fact that the books are kept with the accounts charged against appropriations rather than against the work actually performed in the different divisions of the department, it is tedious or impossible to work out the yearly expenses of the department, showing the cost of maintaining any particular division. It is therefore difficult to give any figures which would be of value in comparing the work done in Baltimore with that done in other cities.

Appropriations.

A study of the budget of the city of Baltimore for the year 1914 shows that there is appropriated for purposes of public health and sanitation the following amounts:

| | |
|--|-----------------|
| Health department..... | \$242, 190.00 |
| Commissioner of street cleaning (collection of garbage and ashes and street cleaning)..... | 834, 878. 22 |
| Free public bath commission..... | 81, 302.00 |
| Sewage commission..... | 1, 864, 923.00 |
| Water department..... | 3, 057, 358. 32 |
| | <hr/> |
| | 6, 080, 651. 54 |

A further study shows that of the amount appropriated to these departments there is a certain amount for new construction, as follows:

| | |
|----------------------------|-------------|
| The health department..... | \$10, 000 |
| The sewage commission..... | 1, 431, 104 |
| The water department..... | 2, 380, 565 |
| | <hr/> |
| | 3, 821, 669 |

Baltimore has only recently started to provide modern sewers and water supplies, and is thus naturally under heavy expense for new construction. This expense for new construction should not be considered ordinary expenses. In making a study of the expenses for public health and sanitation, therefore, this amount should be subtracted from the total as given above, which would leave appropriated for the maintenance of public health and sanitation the sum

of \$2,258,982.54, which is approximately 10 per cent of the total budget, which amounts to \$22,432,349.92, of which the department of public health gets but a very small percentage, being only 10 per cent of the total amount appropriated for public health and sanitation, or 1 per cent of the total budget. The city could well afford to appropriate more to the health department without being considered extravagant.

The Field Force.

The field force being of such vital importance to a health department in carrying on its operations, it is given separate consideration under the following heads: Chiefs of bureaus or divisions; health wardens, who might properly correspond to medical inspectors; chief inspector, and sanitary inspectors.

Chiefs of bureaus or divisions.—The heads of those subdivisions of the department sufficiently well organized to be called "bureaus" or "divisions" are all capable, display much interest in their work, and give full time to the department. One is already a bureau chief and at least one other should be promoted to a similar position. All are worthy of an increase in salary.

Health wardens.—Health wardens, known under the ordinance as vaccine physicians, are appointed by the commissioner of health. There is one for each ward in the city, or a total of 24, and each receives \$900 per year. They must be residents of the ward from which they are appointed. The duties of a health warden are defined by ordinance, as follows:

1. To vaccinate every resident of his ward who may be designated by the commissioner or assistant commissioner of health as susceptible to smallpox.
2. To visit each dwelling in the ward and vaccinate every person who may be presented to him for that purpose.
3. To be prepared in his office at such hours as may be designated by the commissioner to vaccinate all residents of the ward who call upon him requiring vaccination.
4. To keep a record of the names, ages, and residences of all whom he may vaccinate or revaccinate and report monthly to the commissioner of health.
5. To report to the commissioner of health monthly the names of persons who refuse vaccination for themselves or members of their household.
6. To discharge the duties of sanitary inspector for his ward.
7. To act as health warden for his ward.
8. To sign certificates of vaccination for school children.
9. To have general supervision over the health of the ward.
10. To report nuisances to the commissioner of health.
11. To take the necessary steps, under the direction of the commissioner of health, to arrest the progress of any contagious disease occurring within his jurisdiction.

Some years ago men occupying this position did not have to be physicians, and the places were mostly filled by persons who could not qualify for any other place in the political organization.

It was then decided to at least require that they be graduate physicians, and their duties became those of a sanitary inspector as well as a medical inspector.

The entire system is bad. All authorities agree that health officers should be all-time men, that they should receive sufficient compensation to make up for lack of private practice, and that they should hold their office as long as they are efficient workers.

At the beginning of the present administration 11 health wardens lost their positions through politics.

They all have private practices, which under present conditions is naturally more important to them than their official work. This official work is not always attended to promptly nor accurately. The man who holds the position is hardly to be blamed. He must not only provide for the present but he must make provision for the future. A salary of \$900 a year is not sufficient to live on without private practice, and the uncertain tenure of office prevents him from specializing in public health work in the hope that he may be a permanent health officer in the health department.

While the ordinance gives the appointing power to the commissioner of health, he may only appoint such men as are nominated by higher authority. This method of appointment, and the fact that no special qualifications are necessary, makes it impracticable in most cases to secure men with proper qualifications and experience.

The corps of health wardens corresponds to an active working force of a bureau of epidemiology or communicable diseases, which should include medical inspectors who should be doctors of public health, and sanitary inspectors who should have practical knowledge of sanitary matters.

The amount which is spent for health wardens, \$21,600, would employ eight all-time public health officers at \$2,000 a year, and the remainder could be spent for the employment of efficient sanitary inspectors at \$900 or \$1,000 a year.

These medical inspectors could perform the work that is now being done by the health warden and could perform it better as they would have nothing to do but attend to their official business, and they would be more directly under the control of the department.

There should be a bureau of communicable diseases organized and a bureau chief appointed at not less than \$2,500 a year who would have charge of the medical inspectors.

The duties of these medical inspectors would be essentially the control of preventable diseases. They could also perform the work of school medical inspectors, vaccinators, and the like.

The abatement of nuisances which the health wardens are now required to attend to should be left to the sanitary inspectors, who should be placed in the division of plumbing, which should be reorganized into a bureau of sanitation.

By the appointment of some responsible heads in the department the assistant commissioner of health would be relieved of much

detail work which at present prevents him from attending to more important matters.

The chief inspector of the bureau of food and dairy inspection.—There is actually but one employee in the department whose duties are such as to justify the title chief inspector.

The duties of this chief inspector are to supervise the work of the inspectors, assigning them to their different details. He is responsible to the bureau chief for the discipline and conduct of these men. In addition he has a great deal of office work in connection with the inspection of milk and other foods, and receives many of the complaints, turning them over to the proper inspector for investigation.

The present incumbent is a capable man with experience.

Inasmuch as the most important part of the work of the health department depends upon its inspectors, it is essential that the work of these inspectors should be followed up frequently in order to determine whether they have performed their duty, and it should be one of the principal duties of the chief inspector to inspect frequently the work of the men under him. It might also be one of the duties of the clerk to inspect the work of the inspector when the chief inspector is unable to take the field. At the present time such inspection is not carried on systematically.

The inspectors.—It has been said that a health department is no better than its inspectors, or that a health department may be known by the inspectors it employs.

As is to be expected, the inspectors now employed vary in ability, some of them being efficient and some inefficient. Inquiry shows a condition which renders it in some cases difficult to have the work of the bureau performed satisfactorily. It would seem that party leaders look upon the department of health as a place where men may be placed in lucrative positions as remuneration for their political services regardless of aptitude for health work or educational attainments. This applies to the office as well as the field force. Such men are apt to place party considerations ahead of health regulations and refrain from taking any action that might anger party voters, especially near election times.

It is within the power of the commissioner of health to appoint and to discharge employees, but he is handicapped in that, for political reasons, higher authority reserves the right to nominate, and the nominees are rarely of the type that is required to make efficient inspectors. The men so nominated frequently not having the required attainments, it was decided to hold an examination to determine their qualifications. The questions submitted at a recent examination were those that any man of intelligence should have answered satisfactorily, but the results proved that out of five nominees one only was capable of doing so.

Even though an inspector has become efficient, the frequent changes in administration make his position very unstable, and should he lose his position his substitute can hardly be any better and is frequently worse. Only inefficiency can be expected from such a system, and discipline is difficult to maintain for the reason that the employee has more confidence in the power of his political supporters to retain him than he has in the power of his superior in the department to discharge him when he is guilty of any dereliction of duty.

It is not unusual to find that where a number of men are employed in city work a certain proportion of them have no sense of responsibility and do just as little as possible without being found out. Only recently in the bureau of food and dairy inspection it was discovered that an inspector who had been assigned to a certain district had made no inspections, but had falsified his report, and had put in the afternoon attending to personal business. This man lost his position, and no doubt others would follow if a proper follow-up system were inaugurated. A glance over the reports of the inspectors shows that too many of them are absent on account of sickness. It is inconsistent that a number of able-bodied men should have so many lost days for this or any other reason, and if the matter were followed up carefully, which it is not, it would probably be found that at times some of them were simply finding an excuse to get away from their regular work for the purpose of attending to personal matters.

There are certain inspectors also who will think up any excuse to avoid going to work. On a stormy day not long since two of them suggested to the chief that the inspection of stores would be dangerous in that signs might be blown down upon them. They were told to inspect just the same, and as far as could be learned there was no undue mortality in Baltimore on that day from falling signs.

It is a mistake to employ inspectors under any designation which implies the nature of their work, as, for instance, milk inspectors, food inspectors, etc. Men so employed get the idea that they are to be specialists along certain lines and rather resent being asked to perform any other duties. Except, perhaps, in the case of inspectors of plumbing, who should be master plumbers, employees of the inspection force should be employed merely as inspectors of the health department and should be given instruction in the work of different bureaus and be subject to detail from one bureau to another when emergencies arise.

Loyalty among the inspectors is necessary and it is secured with difficulty when political influence plays too great a part in appointment and retention in office. They may be loyal to their political supporters, but are not so apt to see the need for loyalty to their department.

Mention has already been made of the nurses employed in the tuberculosis division.

There is in the department also a noticeable absence of messengers, so that the clerks receiving \$900 are called upon to furnish messenger service which could well be performed by boys at very much less salary.

Transportation of the Department.

In order to carry on its work effectively, the department has the following vehicles:

Fumigation division: Five fumigating wagons, one dead wagon, one incinerating wagon, one ambulance, one wagon for suspects, one automobile (passenger).

Food and dairy division: One buggy, one motor cycle.

Plumbing division: One motor cycle.

The horses employed do not belong to the city, but are hired.

Other Public Health Activities not Under the Control of the Health Department.

Free public baths.—The free public baths and convenience stations are under the control of what is known as the Free Public Bath Commission instead of under a division of the department of health, as they should be.

Baltimore is fairly well provided with facilities for furnishing baths to the poor, and of the few public laundries in the United States five may be found in the city of Baltimore.

There are seven permanent bathhouses, five portable bathhouses, four outdoor swimming pools, two public-comfort stations and a third under construction. Of the five portable baths only one is open the year round, the others being for summer use only. Most of the permanent bath buildings were built by philanthropists and afterwards turned over to the city. Each of the public laundries is housed in a building which also contains baths. The type of bath used in all cases is the shower bath, which is the cheapest, most sanitary, and most convenient.

The portable bathhouses may be moved from place to place, so that different sections of the congested parts of the city may be reached.

They all provide a revenue, as 3 cents is charged for a bath for people over 12 years of age; under that age no charge is made. In the swimming pools the price varies from 1 to 3 cents, according to the age. Three cents an hour is charged for the use of the public laundry.

The permanent bath buildings are divided into two parts, one for men and one for women. There is also a bath building especially for negroes. In the other places certain days are set apart for females.

During the year 1913 the number of people making use of these facilities was as follows: Indoor baths, 746,840; outdoor baths, 301,969; or a total of 1,048,809; the public-comfort stations, 863,013; and public laundries, 22,500.

The cost of this work was \$72,358.17, with revenues amounting to \$22,229.84, making it partly self-supporting.

Water supply.—On account of the improvements which are being made in the water supply of the city of Baltimore it is especially worthy of an extensive study, but details are omitted in this report. In the year 1881 Baltimore inaugurated what was supposed to be an adequate system of water supply from the Gunpowder River. It proved to be deficient in amount and badly polluted, but it is only in recent years that the people have fully realized this, and therefore the necessity for a more adequate and a cleaner supply. At present there is a dam under construction across the Gunpowder River above the old dam which will impound 2,000,000,000 gallons of water and which in time will be raised higher, so that 21,000,000,000 gallons can be impounded. There are also under construction 32 rapid sand filters, each to filter a minimum of 4,000,000 gallons a day.

The present consumption of water in Baltimore amounts to 75,000,000 gallons per day. It is at present not filtered, but is treated by alum and hypochlorite of lime. The old dam forms an artificial lake known as Lock Raven. From here the water passes into a sedimentation basin known as Lake Montebello. Before entering this lake it is mixed with alum. At the outlet it is mixed with lime, one and one-half parts per million, and passes on to the distributing reservoir. The use of lime has proved highly efficacious, as shown by the low typhoid rate in the city at present.

Collection and disposal of refuse.—The duty of collecting and disposing of garbage and rubbish is not vested in the department of health, but comes under the control of the commissioner of street cleaning. This duty might properly be placed under the control of the health department.

Requirements of ordinances.—A summary of the ordinances relating to the collection of garbage is as follows:

In general the ordinances provide that gutters must be kept clean and that no garbage or rubbish may be deposited in them or on any street, etc., or public place, and that the occupant of any house must place daily in the rear of the premises suitable boxes for garbage and ashes, and that these boxes must be removed from the sidewalk within one hour after they are emptied by the city collector.

All sidewalks and gutters must be kept open and free from obstructions. For violation there is provided a fine of not less than \$2 nor more than \$10 or imprisonment in the city jail for not more than five days.

The ordinance specifies that garbage and rubbish must be kept in separate containers, but does not specify what kind of containers, except to say that they shall not exceed a capacity of 1 bushel each. The ordinance distinctly specifies that garbage and ashes must be kept separate.

A regulation of the department of health requires that all garbage containers must be kept covered.

Garbage is collected by the city twice a week during the winter months and four times a week during the summer months, and every day throughout the year from hotels, lunch rooms, restaurants, and the like. It is taken to two different parts of the city on the

water front some distance removed from dwelling houses, where it is dumped into scows and finally disposed of by reduction, the reduction plant being owned by a private corporation. After the garbage is dumped on the scows it becomes the property of this corporation. The fat is extracted and the refuse sold, to be made into fertilizer.

The carts used in collecting refuse are the wooden-bottom type with canvas covers and have a capacity of approximately 2 cubic yards. The wagons used for hauling garbage from hotels, etc., are double this capacity.

The average haul to the scow is about 4 miles. There is one 7½-ton automobile garbage truck, which is located at a central point and receives the contents of the carts from that section of the city, thus saving greatly in the length of the hauling. This system should be adopted all over the city.

During the year 1913 there were removed 180,531 cubic yards of garbage.

The same carts are used in the removal of ashes, this being done on alternate days, four days in the week in winter and two days in summer. The ashes are used for filling, and during the year there were 464,720 cubic yards of ashes removed.

In the work of collecting garbage and ashes there are employed 210 men.

Exclusive of the salaries of the officers and office force the cost of collection of garbage and refuse for the year 1913 was \$221,114.77. In addition to this amount there was paid the corporation owning the reduction plant the sum of \$66,500.

Children's playgrounds.—There are a number of playgrounds for children in the city, located in parks and school grounds. They come under the control of the children's playground association, and the city is authorized by ordinance to furnish the association with \$3,000 per year for their maintenance. The school nurses of the health department not being employed during the summer in school work, two of them are employed by the playground association to care for children in the children's playgrounds. This is a very excellent idea, and all of the school nurses should be utilized for this work. They should be paid by the city and given \$900 for the full year's work rather than \$600 for the school year's work, which is the present arrangement. Naturally these nurses are familiar with the pupils of the public schools, and it would simply be another method of following up by having them in the playgrounds where they will encounter the same children.

District nurses.—The instructive visiting nurses' association have in the field 16 nurses whose work carries them outside of the city limits into the counties. They do general nursing among the poor when

called upon by the physicians, charitable organizations, and by the people themselves. One of them does only obstetrical nursing. Where possible the patient is supposed to pay a fee of 50 cents for each visit.

This work could properly be taken over by the city, as it has a very important bearing on the health of its people.

Control of infant mortality.—According to the statistics for the year 1912 there would be a mortality of children under 1 year of age of 178 per 1,000 births. This figure is too high, partly due to the fact that many births are not recorded. It might also be said that stillbirths are not included in this figure.

The high death rate clearly shows that there is need for a thorough study of infantile morbidity and mortality and that proper measures should be taken to reduce the death rate. This is not at present being done by the city, but receiving some attention by several charitable organizations, one of which is known as the Baby Milk Fund Association.

Infant milk stations which formerly existed have been abolished, and instead there are maintained infant welfare stations, where instruction in infant feeding is given. Instruction is also given in homes by the visiting nurses of the association. Good milk is delivered to the houses of the poor if they desire it. If they can afford it they are charged 8 cents a quart; if not the federated charities furnishes the milk free of cost. This work includes prenatal care as well as the care of the child from three weeks after birth until three years of age. No charge is made for these visits.

This work should also be taken over by the city and carried on by its force of nurses. It would be necessary to increase the number of nurses and to place the school nurses, tuberculosis nurses, district nurses, and child welfare nurses under one head, so that their work could be properly allotted and duplication avoided.

Conclusions and Recommendations.

The study has given rise to certain conclusions, which are stated below in the form of recommendations, as follows:

1. That the organization and conduct of the health department be based on efficiency and not on political expediency and that every public-spirited citizen of Baltimore use his best efforts to attain this end.

2. That the commissioner be given the authority without interference to reorganize his department, and that if necessary the city charter be amended so as to permit fully of this reorganization.

3. That the department be reorganized into main offices or bureaus, as follows: The office of the commissioner of health, the office of the

assistant commissioner of health, a bureau of communicable diseases, a bureau of food and dairy inspection, and a bureau of sanitation.

4. That the collection and tabulation of birth and death statistics be organized into a division and made a part of the office of the assistant commissioner of health.

5. That a division of finance and property be formed from the present office of the secretary and made a part of the office of the commissioner of health.

6. That the bureau of communicable diseases be divided into four parts, a division of medical inspectors, a division of nursing service, a division of bacteriology and a fumigation division.

7. That the bureau of food and dairy inspection remain as it is, except that a division chief be appointed to serve under the present bureau chief, to be in charge of the chemical laboratory.

8. That the present bacteriological laboratory be made a division and placed under the bureau of communicable diseases.

9. That the bureau of sanitation be divided into a division of plumbing inspection, a division of sanitary inspection, and a division of tenement-house inspection.

10. That the present office of the complaint clerk be transferred to the bureau of sanitation under the division of sanitary inspection.

11. That a chief be appointed for each bureau, such chief of bureau to receive not less than \$2,500 per year.

12. That a chief be appointed for each division, such division chief to receive not less than \$2,000 per year.

13. That all chiefs of bureau, chiefs of division, and other officers and employees of the health department be selected solely on account of qualifications, be all-time men, and hold their office during efficiency and good behavior.

14. That the one person appointed as chief of the bureau of communicable diseases be an expert in public health, to be in charge of the department in the absence of the commissioner and the assistant commissioner.

15. That the position of health warden be abolished and in place of the 24 health wardens there be employed eight all-time medical inspectors versed in public health and sanitary science and to receive from \$1,500 to \$2,000 per annum.

16. That the force of inspectors be increased in number, that they be not employed for any special work but subject to detail with the different bureaus and that they be given preliminary instruction in the work of the whole department, and that they hold their office during efficiency and good behavior.

17. That all nurses connected with the department be placed in the division of nursing service, this to include tuberculosis nurses,

school nurses, infant mortality nurses, district nurses, hospital and quarantine nurses, and that they be subject to changes of detail within the department.

18. That the force of nurses be increased.

19. That the responsibility of collecting and keeping check on the reports of communicable diseases be placed under the chief of the bureau of communicable diseases, the annual statistical compilation and tabulation of these records to be performed in the division of vital statistics for the bureau of communicable diseases.

20. That the work in connection with school inspection, vaccination, special investigations of communicable diseases, etc., be performed by the regular force of medical inspectors of the department.

21. That medical inspectors be relieved of the work in connection with the inspection of nuisances and this matter be performed by the sanitary inspectors of the division of sanitation.

22. That the record of finance be so kept that the commissioner of health can call at any time for the financial status of any particular division or bureau or piece of work.

23. That no warrant for articles bought be signed by the commissioner until the bill submitted has been checked by the head of the bureau for whom the articles were bought.

24. That requisition be required for all articles wanted, signed by the bureau chief, and not bought unless approved by the commissioner.

25. That the control of public baths, laundries, and playgrounds be transferred to the department of health and made a division in the bureau of sanitation.

26. That a hospital of 500 beds be erected for the hospitalization of communicable diseases occurring in the city of Baltimore.

27. That the quarantine station be turned over to the United States Public Health Service, the money paid for the station to be credited to the health department as a fund for the "prevention and control of communicable diseases," and that the United States Public Health Service continue to care for cases of "quarantinable diseases" occurring within the city, and be reimbursed by the city for such care until such time as the city is able to care for those diseases.

UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION
IN MINNESOTA

BY

CARROLL FOX

Surgeon, United States Public Health Service

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PUBLIC HEALTH ADMINISTRATION IN MINNESOTA.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

Following the publication of the report on the study of the State Health Department of Maryland, a request was received from the State of Minnesota to carry on a similar study of its State board of health. This study was started about June 1, 1914, and continued throughout a period of three months. It has been gratifying to the investigator to observe the modern and scientific methods used in the control of communicable diseases in Minnesota.

The State board of health was organized in 1872. Since that time its duties and work have steadily increased until it is now worthy of the title and the position of a State department of health. Its present name is a misnomer as it implies a board of health only, whereas in reality the board is but the controlling head of a number of divisions which are as follows: The executive office, the division of preventable diseases, the division of sanitation, the extension division, the division of vital statistics, and the clerical division. Some of these divisions are further subdivided, as will be pointed out later.

The headquarters of the State board of health and some of its divisions are located in the State capitol building in St. Paul, whereas the divisions of preventable diseases and of sanitation are located on the University campus in Minneapolis. This is a very inconvenient arrangement for administrative reasons, but, on account of the rivalry between the cities of St. Paul and Minneapolis, any change tending to locate all of the divisions of the board in one place might not meet with public approval. A healthy rivalry between cities is no doubt to be commended, but it should not be permitted to stand in the way of ease and effective administration of any unit of a State government.

STATE BOARD OF HEALTH.

Membership and tenure of office.—The State board of health is composed of nine members appointed by the governor. Their term

¹ Reprint from the Public Health Reports, vol. 29, No. 40, Oct. 2, 1914.

of office is three years. Three members are appointed each year. They are required to be "learned in sanitary science."

Meetings.—The board meets annually on the second Tuesday in January and elects a president from among its members. Other meetings are held regularly on the second Tuesday of April, July, and October. Thus they have only four regular meetings during the year, but the law permits them to hold special meetings, which may be called by the secretary or any two members of the board upon three days' notice. A majority constitutes a quorum.

The president presides at the meetings and in the absence of the secretary performs his duties, in which event he receives the same pay as the secretary. He may, however, appoint a secretary pro tempore to keep the minutes.

Salary and expenses.—The members of the board do not receive any salary or per diem, but are allowed necessary traveling expenses.

Powers and duties.—The powers and duties of the board are as follows:

1. To exercise general supervision over all health officers and boards.
2. To take cognizance of the interests of health and life among the people.
3. To investigate sanitary conditions.
4. To learn the cause and source of disease and epidemics.
5. To observe the effect upon human health of localities and employments.
6. To gather and diffuse proper information upon all subjects to which its duties relate.
7. To gather, collate, and publish medical and vital statistics of general value.
8. To advise all State officials and boards in hygienic and medical matters, especially those involved in the proper location, construction, sewerage, and administration of prisons, hospitals, asylums, and other public institutions.
9. To report its doings and discoveries to the legislature at each regular session thereof, with such information and recommendations as it shall deem useful.
10. To adopt, alter, and enforce reasonable regulations to apply to the whole or any part of the State, and to be permanent or applicable only for a specified period. These regulations must be approved by the attorney general, and must be published, if of general application, for three weeks at the seat of government. If of local application, they must be published as near the locality as practicable. Special rules applicable to particular cases may be posted in a conspicuous place upon or near the premises affected. Any person violating any such regulation is guilty of a misdemeanor and is liable to a fine of not more than \$1,000 or by imprisonment in the county jail for not more than one year, or both. Fines collected for violation of State regulations are paid into the State treasury; for violation of regulations of local boards of health, into the county treasury. Regulations issued by the State board of health have the effect of law, when properly approved and published, except in so far as they may conflict with existing law or charter or ordinance of a city of the first class.

The law specifies the subjects on which the State board of health may make regulations, which at times may limit its authority and

prevent it from taking action on certain important public-health matters. Regulations may be issued covering the following subjects:

1. The manufacture into articles of commerce, other than food, of diseased, tainted, or decayed animal or vegetable matter.
2. The business of scavenging and the disposal of sewage.
3. The location of mortuaries and cemeteries and the removal and burial of the dead.
4. The management of lying-in houses and boarding places for infants, and the treatment of infants therein.
5. The pollution of streams and other waters and the distribution of water by private persons for drinking or domestic use.
6. The construction and equipment, in respect to sanitary conditions, of schools, hospitals, almshouses, prisons, and other public institutions, and of lodging houses and other public sleeping places kept for gain.
7. The treatment, in hospitals and elsewhere, of persons suffering from communicable disease, the disinfection and quarantine of persons and places in case of such disease, and the reporting of sickness and deaths therefrom.
8. The furnishing of vaccine matter; the assembling during epidemics of smallpox, with other persons not vaccinated. A provision of this paragraph prevents the State board of health from carrying out any very extensive vaccination as it prohibits them from excluding children from school except during epidemics. This subject will be taken up later on.
9. The accumulation of filthy and unwholesome matter to the injury of the public health, and the removal thereof.
10. The collection, recording, and reporting of vital statistics by public officers, and the furnishing of information to such officers, by physicians, undertakers, and others, of births, deaths, causes of deaths, and other pertinent facts.

The board is also authorized to establish and enforce a system of quarantine against the introduction into the State of communicable diseases by common carriers.

All of the members of the board of health are practicing physicians, not in politics, and in sympathy with public-health work. Their meetings are businesslike and to the point. Since their secretary is a specialist in public-health matters, on duty every day, and thoroughly familiar with administrative details, while they meet but once in three months they almost invariably support his actions.

In order that the business of the board may be transacted with greater facility there is an executive committee, composed of five members of the board, appointed by the president. Previous to a regular board meeting this committee meets with the secretary and business to be brought before the board is discussed and recommendations are decided upon. These recommendations are nearly always in line with the ideas of the secretary and are usually promptly approved by the board.

In view of the dependence necessarily placed on the executive officer the question arises whether nine men are really necessary to support his actions. By reason of the method of appointment of members of the board it is, of course, not likely to be political, but

five members, or, at most, seven would appear to be sufficient. Furthermore it would appear that this board should be advisory and not executive, and the executive officer who is to assume the responsibility during lengthy intervals between meetings of the board should have direct authority to do so.

THE EXECUTIVE OFFICE.

The executive office is the administrative office of the State board of health and is in charge of the secretary and executive officer of the board. He receives \$4,500 per year. He is appointed by the board of health, but does not become a member, having no vote in its proceedings.

Duties of the secretary.—The duties of the secretary, under the law, are as follows:

1. To act as executive officer of the board.
2. To keep a record of the proceedings.
3. To see that all rules and regulations of the board and all duties laid upon it by law are enforced and performed.
4. To see that every law enacted in the interests of human health is obeyed.
5. To be custodian of the official records and documents of the board.
6. To act as State registrar of vital statistics.

The present incumbent has held his office for 17 years. Like the secretary of the State department of health of Maryland, he is one of the not too many all-time State health officers.

In 1911, after 14 years of continuous service to the State, the legislature cut the salary of the secretary from \$5,000 to \$4,000. A vote of thanks from the legislators and a substantial increase of appropriations for public-health work would have been a just reward, and an inspiration to the entire force engaged in conserving the public health. The board recognized that the reduction in salary relieved the secretary from giving his whole time to the board's work; a relief of which he did not, however, take advantage.

In 1913 the legislature partly made amends for its previous action, by changing the maximum salary of \$4,000 for the secretary to \$4,500.

Attorneys of the State Board of Health.

The State board of health is not authorized to employ attorneys. All legal advice is secured from the office of the attorney general, one of the assistants being detailed to attend especially to the legal work of the State board of health. Not only may advice be obtained, but the assistance of this attorney may be secured in prosecuting cases in court. If his services, for any reason, are not available, the at-

torney general may authorize the State board of health to employ a lawyer. This seems to be a satisfactory arrangement.

Office Hours.

The office hours of the different divisions of the State board of health are from 9 a. m. to 5 p. m., with an hour for lunch, making a working day of seven hours. On Saturday the hours are from 9 a. m. to 12 noon.

In the bacteriological laboratory there are two employees—a clerk and a laboratory boy—on duty Saturday afternoon and one-half of Sunday and holidays, receiving for such overtime 25 cents an hour in an amount not to exceed \$1. There is some one on duty in the bacteriological laboratory at all times of the day and night to receive cultures and place them in the incubator if necessary. Such night duty is performed by the night watchman employed by the university, and therefore does not count as overtime.

Other clerks employed in overtime receive their regular pay plus 5 cents per hour for stenographic work, provided the maximum pay per hour does not exceed 50 cents, and 25 cents per hour for ordinary copying.

An annual vacation of two weeks is allowed each employee.

The officials under the State board of health are all-time men, with the exception of the director of the division of sanitation, the consulting engineer, and the assistant director of the extension division. The two former are on the staff of the University of Minnesota and give part of their time to, and receive part of their salaries from, that institution. Such an arrangement is neither to the best interests of the State board of health nor to the university. A man can not serve two masters and serve them both well. He should look to either one or the other for his pay and authority, especially when both employers are State institutions. Perfect cooperation requires that the services of employees shall be loaned for short periods from one department to another if such services are needed, but reimbursement to the individual should come from one source only. This applies especially to directors of divisions, whose whole time should be given to their divisions.

THE DIVISION OF PREVENTABLE DISEASES.

At the meeting of the board of health held April 14, 1914, the board decided upon a reorganization of its divisions. Previous to this there had been a division of engineering, a division of epidemiology, and a laboratory division, which latter comprised the bacterio-

logical laboratories (main and branch), the clinical laboratory in which the sewage and water work was done, and the Pasteur institute. The change consisted in separating the sewage and water work and placing it in a division of sanitation, and combining the bacteriological laboratory and Pasteur institute with the then existing division of epidemiology, thus making a new division, called the division of preventable diseases. This reorganization was a wise procedure, as it placed all the work in connection with the immediate control of preventable diseases under one head.

The division of preventable diseases is further subdivided, according to the nature of the work performed, into a subdivision of epidemiology, a subdivision of bacteriology, and a Pasteur institute.

The personnel of the division and their salaries at present are as follows:

SUBDIVISION OF EPIDEMIOLOGY.

| | |
|------------------------------------|----------|
| 1 director of division..... | \$3, 500 |
| 2 epidemiologists, at \$2,400..... | 4, 800 |
| 1 stenographer..... | 1, 020 |
| 1 stenographer..... | 780 |
| 1 typist..... | 690 |
| 1 typist..... | 525 |

SUBDIVISION OF BACTERIOLOGY.

| | |
|--|--------|
| 1 chief, main laboratory..... | 2, 800 |
| 1 stenographer..... | 1, 030 |
| 1 clerk..... | 540 |
| 1 head attendant..... | 1, 140 |
| 1 attendant..... | 840 |
| 1 attendant..... | 510 |
| 1 attendant..... | 480 |
| 1 bacteriologist in charge, Duluth and St. Louis County branch laboratory..... | 1, 700 |
| 1 laboratory assistant and clerk..... | 720 |
| 1 bacteriologist in charge, Mankato branch laboratory..... | 1, 000 |

PASTEUR INSTITUTE.

| | |
|-----------------------------------|--------|
| 1 chief of Pasteur institute..... | 3, 000 |
| 1 attendant..... | 600 |
| 1 caretaker, animal house..... | 720 |

20

26, 395

Duties of the division.—The subdivision of epidemiology has under its charge the epidemiological work, including the collection and disposition of morbidity reports and the study and control of preventable diseases.

The subdivision of bacteriology or main laboratory is concerned with the examination of cultures, blood specimens, etc., as an aid in

the diagnosis of diseases and to determine the period at which quarantine or observation may be safely terminated. This subdivision is also responsible for the manufacture and issue of antityphoid vaccine, and has general supervision over the work of the branch laboratories.

The Pasteur institute is responsible for the manufacture of antirabic virus, the administration of antirabic treatment, and the laboratory diagnosis of rabies.

The activities of the division of preventable diseases will be taken up under the following headings: Notification of preventable diseases, control of preventable diseases, bacteriological work, and the Pasteur laboratory.

Notification of Preventable Diseases.

Requirements of law.—The law giving the authority to the State board to require the notification of preventable diseases is summarized as follows:

The board is required to gather, collate, and publish medical and vital statistics of general value.

It may adopt, alter, and enforce reasonable regulations relating to the reporting of sickness and deaths from communicable diseases.

Tuberculosis.—In addition there is a specific law requiring the reporting of tuberculosis which states that physicians must report to the State board of health on blanks furnished by the board full particulars of every person under their treatment suffering with tuberculosis within one week after the diagnosis has been made. Where local ordinance or regulations specify, the physician is required to report tuberculosis to the local health officer who then reports to the State board of health once a month.

Occupational diseases.—In addition to the above there is a law requiring the reporting of occupational diseases. This law depends upon the bureau of labor for its enforcement and reports are required to be made to the commissioner of labor. It is summarized as follows:

Physicians are required to report patients believed to be suffering from poisoning from lead, phosphorus, arsenic, mercury, or their compounds, or from anthrax, or from compressed-air illness contracted as the result of the nature of the patient's employment. The report must contain the name, address, and place of employment of the patient, the nature of the disease and any other information that may be required by the commissioner of labor. The commissioner of labor is empowered to call upon State or local boards of health for assistance. Upon failure to report on the part of the physician there is provided a fine of not more than \$10 or imprisonment for not to exceed 10 days.

Requirements of regulations.—For the purpose of notification, diseases have been placed in two groups, the first group containing

those which are rarely found within the State, and the second group those which are more or less common.

In the first group are:

| | |
|--------------------------------------|---|
| Actinomycosis. | Paratyphoid fever. |
| Anthrax. | Pellagra. |
| Asiatic cholera. | Plague. |
| Dengue. | Rabies (human cases and exposed persons). |
| Dysentery (a) amebic, (b) bacillary. | Rocky Mountain spotted or tick fever. |
| Glanders. | Trichinosis. |
| Hookworm disease. | Typhus fever. |
| Leprosy. | Yellow fever. |
| Malaria. | |
| Paragonimiasis. | |

A case, or suspected case of, or death from, any of these diseases must be reported immediately by telegram or telephone to the division of preventable diseases; and it is the aim of this division to investigate in each instance and then issue the necessary instructions to local health officers.

In the second group are placed:

| | |
|--|---|
| Anterior poliomyelitis. | Rabies (person exposed to, etc.). |
| Cerebrospinal meningitis. | Scarlet fever (scarlatina, scarlet rash). |
| Chicken-pox. | Smallpox. |
| Diphtheria. (laryngeal croup; membranous croup). | Trachoma. |
| Erysipelas. | Tuberculosis. |
| Measles. | Typhoid fever. |
| Ophthalmia neonatorum. | Whooping cough. |

A case, or suspected case of, or death from, any of these diseases must be reported on a regular reporting post card by the attending physician or other person to the local health officer or to the chairman of the board of supervisors, as the case may be. Specific regulations for the control of these diseases have been promulgated by the State board of health to be enforced by the local health officer.

All communicable diseases occurring among inmates or employees in State institutions must be reported by the superintendent to the division of preventable diseases as well as to the local health officer within 24 hours after the disease is discovered.

Collection and disposition of morbidity reports.—The local health officers always forward original reports to the division of preventable diseases and keep a transcript in the local health office. This is the proper way. The procedure is not required by either law or regulation, but rather by instruction and custom.

There are but two cards used in the notification of diseases—one for smallpox and one for all other diseases. In addition data report cards accompanying specimens submitted for bacteriological examination are of post-card stock and contain all necessary information and are accepted and filed in lieu of original morbidity reports.

The epidemiologists of the division see promptly all morbidity report cards that they may familiarize themselves with new foci of infection and study the progress of the disease in any locality.

As soon as the morbidity reports are received in the division, a clerk stamps them with the date of receipt and examines them to determine if any are duplicates. If so, and if there is any additional information on the duplicate, it is entered on the original and the duplicate destroyed. At the same time certain information is taken from the completed morbidity report for future statistical purposes, monthly report, etc., as follows:

All reports of notifiable diseases are entered in a loose-leaf ledger showing each disease by month, county, and sanitary district. This serves as a monthly report for the secretary of the State board of health, and a copy of it goes to the newspapers of the larger cities of the State. Every county auditor receives that part of the report which refers to his county. The report is accompanied by a summary of all diseases occurring in the State, and a circular letter commenting on the incidence of disease within the State, the methods of transmission, and the precautions to be taken to prevent their spread. This letter is written for laymen and serves in part as a popular bulletin.

All diseases are classified for the month on county sheets, according to age groups and sex. In addition to these county sheets cases of anterior poliomyelitis, cerebrospinal meningitis, and typhoid fever are also classified on separate monthly sheets according to sanitary districts and sex and age groups. Similarly cases of scarlet fever, diphtheria, and tuberculosis are classified, but only those occurring in sanitary districts having a population of 1,000 or over. Cases of smallpox are classified according to sanitary district, age, sex, and vaccination status.

Reports are transmitted monthly to the Surgeon General of the United States Public Health Service giving the information agreed upon by the conference of State and Territorial health officers with the Public Health Service.

When all of the information has been entered on the above sheets, the card is checked and placed in a temporary or permanent file, depending upon whether or not it is to be used later in the "follow-up" system.

The vital statistics division forwards a report of each death due to a notifiable disease (except tuberculosis), and if the morbidity files contain no previous report of the case it is followed up and full particulars are obtained. The slips filled out by attending physicians using antitoxin, issued through the State board of health, are

returned and similarly checked up, as are also unofficial notices of cases of sickness, such as newspaper clipping, etc.

It is of interest to estimate the completeness with which cases of the notifiable diseases occurring within the State are reported. A seemingly unusually high case-fatality rate probably in most instances indicates an incomplete reporting of cases.

For the year 1913 there were reported to the State board of health 3,073 cases of diphtheria with 211 deaths, giving a fatality or case-mortality rate of 6.8 per hundred cases. From this figure it is fair to assume that most, if not all, of the diphtheria was reported, as this is a low fatality rate, especially when it is remembered that many of the cases occurred in rural communities where prompt treatment can not always be administered, and that the poor who can not always afford antitoxin probably had their usual share of the disease. It should be pointed out here that diphtheria antitoxin should be made freely available throughout the State, and the necessary funds for this purpose should be supplied by the State in the interest of the public health.

There were also reported in 1913, 3,487 cases of scarlet fever with 174 deaths, or a case-fatality rate of 5 per 100 cases, and 5,869 cases of measles with 192 deaths, or a case-mortality rate of 3.2.

Every health authority knows full well that a proportion of the cases of scarlet fever and measles are usually not reported for several reasons, among these reasons being that in very mild attacks a physician is not called in, or a correct diagnosis frequently not made; again, the physician may be called in for the first case and subsequent cases in the household treated without his knowledge. It not infrequently happens also that physicians consider they have done their duty when they have reported the first case in a family, regardless of any other cases that may subsequently develop. At any rate the case-mortality rates given above are probably too high, and should not be over 3 per cent for scarlet fever and 1 per cent for measles, which would mean that there probably occurred in Minnesota in 1913, approximately 5,803 cases of scarlet fever and 19,200 cases of measles, assuming that the death records show the number of deaths from these diseases.

In the same year there were 1,297 cases of typhoid fever reported with 227 deaths, or a case-mortality rate of 17.5 per cent. The true case mortality from typhoid is probably not greater than 4 per cent and so, basing the calculation on this figure, there should have been about 5,675 cases reported to the health department.

Likewise, many cases of tuberculosis were obviously not reported, as there were 2,516 cases with 2,227 deaths occurring in 1913, or a case mortality of 88 per cent. While a regulation requiring the reporting

of tuberculosis has been in existence since 1904, the specific law on the subject was not passed until 1913. Before the law was passed the State board had no adequate facilities for handling the disease even when it was reported, but with the new law, which carries with it a provision requiring under certain conditions that counties build and maintain sanatoria, energetic efforts will be made to have all cases properly reported.

There were 2,866 cases of smallpox with 7 deaths, giving a case-mortality rate of 0.24 per cent, or 1 death in 409 cases. It would be interesting to carry on a series of experiments in cross immunity to determine the identity of this mild infection with the virulent types of smallpox occurring in the United States.

The Control of Preventable Diseases.

In studying the activities of the division of preventable diseases in the control of disease it will be necessary to divide them into two general heads—the office work and the field work. Under the former is included a description of the important “follow-up” system which the chief of the division has devised to keep better track of certain of the diseases, especially those which are quarantinable under the regulations. Inasmuch as the division conducts important field operations and has made many valuable investigations and studies, these will be given special consideration.

Requirements of law.—The law bearing on the control of disease is summarized as follows:

The State board of health has the power to adopt, alter, and enforce reasonable regulations relating to the treatment in hospitals and elsewhere of persons suffering from communicable disease and the disinfection and quarantine of persons and places in case of such disease.

The board is empowered to establish and enforce quarantine against the introduction into the State of any communicable disease by common carriers.

Members, officials, and employees of the State and local boards of health have the right to enter into all places in the performance of their duty. Any person who attempts to prevent such entry or in any way willfully interferes with the health officer in the discharge of his duties is guilty of a misdemeanor.

The suppression of disease is a function of the local board of health and the expense is to be borne by the locality. If the local board refuses to perform its duties the State board of health may take the necessary action and charge it against the locality.

The law requires that the expense of caring for a person suffering with a communicable disease, the isolation and the disinfection are chargeable against the family in which the case occurred, and may be collected either by the person performing the work or by the county, town, or municipality. The law specifies the procedure to be used in collecting such expense.

It is prohibited for any person willfully to expose himself or another affected with a communicable disease in any public place or thoroughfare.

If a communicable disease appears in any jail, the warden, with the approval of the board of health, may remove the prisoners who are sick, to prevent the spread of the disease.

The use of common drinking cups in public places, public conveyances, and public buildings is prohibited. For violation there is provided a fine not exceeding \$25.

Requirements of regulations.—The regulations for the control of communicable diseases have been divided into general and specific regulations, the first applying more or less to all of the communicable diseases and the second referring to certain specific diseases only.

A summary of the general regulations is as follows:

Health officers suspecting the presence of any communicable disease must investigate immediately and take all necessary measures. They must report the case, the measures taken, and the date of quarantine release to the division of preventable diseases.

It is prohibited to alter, deface, destroy, etc., any notice relating to a communicable disease. The occupant or person in control of a building upon which such notice is posted is held responsible and must report within 24 hours any destruction or unauthorized removal of this notice.

If a case of diphtheria, scarlet fever, smallpox, trachoma, tuberculosis, or typhoid fever occurs in a common lodging house or hotel, it must be removed by the local health officer, if necessary, to a suitable hospital or place of quarantine. If for any reason the case can not be removed, other persons in the house may be removed after the necessary disinfection has taken place.

No house, building, vessel, vehicle, or article that has been occupied or used by a person ill with a communicable disease can be occupied or used again until thoroughly cleansed.

When infected articles can not be disinfected they may be destroyed at the expense of the sanitary district.

When any order of the local health officer relating to disinfection or cleansing is not complied with, the apartment or premises must be placarded to the effect that they have harbored a communicable disease; that they may be infected; and that they can not be occupied until cleansed and disinfected.

Library books which have been used in a house where there is diphtheria, scarlet fever, smallpox, typhoid fever, or pulmonary or glandular tuberculosis in the infectious stage must be destroyed at the termination of the disease, and it is not permitted to loan library or school books to persons residing in a house where such disease exists.

Bodily discharges must be disposed of without causing offense or danger to others. It is the duty of a person affected with a communicable disease or having charge of a patient so affected to disinfect bodily discharges, to properly screen from flies or other vermin, and to destroy flies or other insects discovered in the sick room. Dogs, cats, or other household pets must be kept out of rooms where communicable diseases are being treated.

Dairy or food products which may be eaten uncooked must not be sold or given to any person from a house where diphtheria, scarlet fever, typhoid fever, or smallpox exists, nor may any person resident in such house handle any of these products offered for sale. If the disease occurs on a farm the sale of its products is forbidden except when those having to handle the food sleep away

from the infected house and have no connection with any person coming from that house.

It is the duty of the local health officer to see that the above regulations are carried out.

Bodies dead of communicable disease must be prepared for burial by a licensed embalmer only.

A person having a communicable disease or residing in a house where such disease exists or has recently existed must not attend any school until permission is received from the local health officer. Parents or guardians must prohibit children under their charge from attending school under these conditions. A schoolhouse wherein a case of smallpox, scarlet fever, or diphtheria has been present must be closed and not opened again until thoroughly cleansed under the supervision of the local health officer.

The above regulations apply in a general way to all the communicable diseases. The special regulations are summarized as follows:

In the case of anterior poliomyelitis, cerebrospinal meningitis, and whooping cough, the patient must be isolated for at least two weeks after the first symptoms appear. The room must be screened against flies or other insects during the course of the disease and convalescence.

In the case of anterior poliomyelitis, cerebrospinal meningitis, diphtheria, measles, scarlet fever, smallpox, tuberculosis, typhoid fever, and whooping cough the nose, throat, and mouth discharges must be received on cloths and burned at once. Bowel and bladder discharges must be disinfected before being discharged in a sewer or cesspool. If no sewer or cesspool exists, the discharges must be disinfected and buried, so as to prevent the access of flies. All articles exposed to possible infection must be properly disinfected.

In the case of death from anterior poliomyelitis, cerebrospinal meningitis, diphtheria, scarlet fever, and smallpox the funeral must be strictly private.

In the case of anterior poliomyelitis, cerebrospinal meningitis, and whooping cough children in the house and persons associated with the patients must be kept under observation for two weeks after last exposure, and during that period must not attend any school or public or private gathering.

Anterior poliomyelitis.—The house must be placarded with the statement that anterior poliomyelitis exists on the premises.

Cerebrospinal meningitis.—The house must be placarded with the statement that cerebrospinal meningitis exists on the premises.

All doubtful cases of cerebrospinal meningitis must be classed as epidemic in form.

Chicken-pox.—The house must be placarded with the statement that chicken-pox exists on the premises. Cases of chicken-pox in persons of 16 years or over must be examined by the local health officer, who must record whether the patient has been successfully vaccinated against smallpox.

Contacts who have had chicken-pox may attend school with the permission of the health officer. Contacts who have not had chicken-pox are not permitted to return to school until two weeks after the disease has disappeared.

Diphtheria.—The house must be placarded with the statement that diphtheria exists on the premises and forbidding people to go into or leave the house without permission. Laryngeal croup and membranous croup must be classed and quarantined as diphtheria.

In suspected cases only the placard shall have the word "Suspected" over the word "diphtheria." Health officers or attending physicians must take nose

and throat cultures and submit them to the division of preventable diseases. If the laboratory reports "Reserved; send another specimen," the house shall remain placarded. If the laboratory reports "Diphtheria," the word "Suspected" alone may be removed from the placard. If the laboratory reports "No diphtheria bacilli found," and the clinical symptoms are not those of diphtheria, the placard may be removed.

Before quarantine may be released two successive negative nose and throat cultures are required. If the patient lives more than 2 miles from a city or village, quarantine may be removed three weeks after all clinical symptoms have disappeared, or earlier if the two successive negative cultures are obtained. No case can be held in quarantine more than six weeks after all clinical symptoms have disappeared.

Contacts must be quarantined unless the case is adequately isolated.

When properly isolated and negative cultures are obtained from contacts, they may carry on their occupations provided they do not come in contact with the patient, the room, etc.

Patients released from quarantine will not be permitted to attend school or other public gathering until two successive negative cultures have been reported.

Contacts wishing to leave premises before quarantine is raised may do so if the cultures from their nose and throat are negative and if they take the proper precautions as to disinfection, etc.

After fatal cases members of the household can not be released from quarantine until the above measures have been taken.

The control of diphtheria in public institutions is governed entirely by laboratory examinations. Persons showing diphtheria bacilli must be quarantined. When one negative culture is obtained they must be disinfected and removed from quarantine, but placed in detention quarters. When two more successive negative reports are obtained they may be released.

Cultures for release must be taken with at least 24 hours intervening.

Findings must be made by the division of preventable diseases or a laboratory having the official indorsement of the State board of health.

Erysipelas.—The house must be placarded with the statement that erysipelas exists on the premises. Cases must be isolated; articles exposed to infection disinfected; discharges from the mucous membranes of the patient received on cloths and burned.

Midwives coming in contact with erysipelas are prohibited from attending a case of confinement, from caring for young children, or handling dairy products, until two weeks have elapsed.

Measles.—The house must be placarded with the statement that measles exists on the premises.

Children are forbidden to leave the premises without the permission of the health officer.

The placard must be kept on the house for 10 days after the disappearance of the disease.

Ophthalmia neonatorum.—When the eyes of an infant become inflamed, reddened, or diseased at any time within two weeks after birth, it is the duty of the midwife, nurse, parent, etc., to report the facts to the local health officer. It is the duty of the local health officer to investigate, and unless the case is under the care of a physician he must give the instructions for treatment and the precautions to be taken to prevent the spread.

Rabies.—When any person is attacked by a rabid animal, or an animal supposed to be rabid, the fact should be reported to the State board of health, which

will determine the advisability of giving the person so bitten the Pasteur treatment.

Scarlet fever.—The house must be placarded with the statement that scarlet fever exists on the premises and that persons are forbidden to leave or go into the house without permission.

In suspicious cases the placard is to contain the word "Suspected" above the words "Scarlet Fever." If the case prove to be scarlet fever the word "Suspected" is removed. If the case prove not to be scarlet fever quarantine is removed.

Unless death occurs earlier, quarantine is never to be less than three weeks from the date of appearance of first symptoms, and may be longer if the condition of the nose, throat, or ears is not normal.

No patient may attend school after quarantine is released until a second examination shows that the nose, throat, and ears are still in normal condition. If an ear discharge exists the patient shall report weekly for examination.

All contacts must be quarantined unless the patient is well isolated. Members of the household may then carry on their occupations except those whose work brings them in contact with children. Contacts under quarantine may be released before the quarantine is removed if they are found to be free of symptoms and not likely to develop the same, provided they agree to report immediately to the health officer should any symptoms develop within 10 days after their release. Clothing must be disinfected.

Trachoma.—School teachers, employers, superintendents, foremen, etc., must report any person having inflamed eyes or who complains of sore or roughened lids. It is the duty of the health officer to investigate such report, and if he finds trachoma or suspected trachoma he must give written directions for the treatment and the precautions to be taken to prevent the spread of the disease. If the circumstances warrant it, the case must be removed to a hospital or other suitable place, quarantined, and treated during the active period.

No person affected with trachoma or suspected trachoma is permitted to attend school without a written permit from the health officer.

Typhoid fever.—The house must be placarded to the effect that typhoid fever exists on the premises.

The patient's room must be screened.

Convalescents must not handle any dairy products or other food products liable to be eaten raw if offered for sale until authority to do so is received from the local health officer.

When typhoid fever prevails in a locality the local board of health is required to appoint immediately an inspector or inspectors who shall report to the local board of health all closets that are not fly proof and vaults and cesspools that are not water-tight and fly proof. Drinking water which is considered a possible source of infection must be condemned.

Whooping cough.—The house is to be placarded to the effect that whooping cough exists on the premises.

Smallpox and vaccination.—The law on the subject of smallpox and vaccination is very meager and is a handicap rather than an assistance to the State board of health, as it distinctly limits their actions in the enforcement of vaccination.

The following is a summary of the law relating to vaccination:

Requirements of the law.—The State board of health may furnish vaccine matter and must prohibit the assembling during epidemics of smallpox of persons not vaccinated. The board, however, can not compel the vaccination

of a child, or exclude such unvaccinated child from school except during epidemics of smallpox and when approved by the local board of education. A person may select any physician he may wish to perform the vaccination.

The power which is given to the board of health seems to depend on whether smallpox is epidemic. In other words, it is necessary to wait until the whole town is afire before the fire department can act. In order to handle the question, certain regulations had to be made which would in part answer the purpose and at the same time not conflict with the law.

While the law interferes with the board of health in its vaccination campaign among school children, it does not prohibit the closure of schools in case of the appearance of smallpox. This has been taken advantage of in the regulations by requiring that unless the necessary vaccination has been made among the pupils schools must be closed.

Requirements of regulations.—The following is a summary of the regulations:

All officials and employees of State institutions whose duties bring them into contact with the wards of the institution are required to be successfully vaccinated.

If smallpox prevails in a community or appears in a school, all unvaccinated teachers and pupils must be excluded for a period of three weeks unless vaccinated within three days of first exposure. Failing to comply with this, the school must be closed for a period of three weeks.

If smallpox appears in any class in any college in Minnesota, all unvaccinated teachers and students in the class must be excluded for a period of three weeks unless vaccinated within three days of first exposure. Failing to comply, the class must be discontinued for a period of three weeks.

The house must be placarded to the effect that smallpox exists on the premises. Patients must not leave the house until the card is removed.

Contacts who can not show evidence of recent successful vaccination, or of having had an attack of smallpox, must either be vaccinated within three days of first exposure or isolated 21 days after last exposure.

Only persons protected by vaccination are allowed to go into or leave the house.

All of this information is contained on the placard.

Tuberculosis.—In 1913 a law was passed adding to the laws already enacted for the control of tuberculosis. A very important provision of this law empowered the counties to erect and maintain county sanatoria for the treatment of tuberculosis, especially the advanced cases.

Requirements of law.—The laws relating to tuberculosis are summarized as follows:

County commissioners of any county have the power, with the approval of the advisory commission of the State sanatorium for consumptives, to establish and maintain sanatoria. These county sanatoria are controlled by a county sanatorium commission, composed of three members appointed by the county commissioners. One of these members must be a physician approved by the

State board of health. Several counties may unite in providing one sanatorium. The plans for such sanatoria must be approved by the State board of health as to the sanitary provisions.

Under the provisions of the law the State is empowered to furnish one half of the expense of construction and equipment, provided that such sum does not exceed \$50,000, and for the maintenance of each free patient treated in a county sanatorium the State is authorized to pay \$5 per week to the county. To cover these expenses the State appropriated \$250,000. The law goes into detail as to the methods to be pursued in carrying out its provisions.

In penal and charitable institutions tuberculosis patients must be treated in separate wards or rooms.

The health officer has the right to report to the board of county commissioners that any case of tuberculosis is a menace to the public, and such board has the right to order the patient removed to a hospital for treating the disease, where he must remain until properly discharged.

Teachers afflicted with pulmonary tuberculosis are prohibited from attending school unless they have a certificate from the health officer that they are in no danger of spreading the disease. This applies to pupils as well.

Where tuberculosis patients have ceased to occupy any apartment by reason of death or removal, the health officer must be notified, when the apartment must be disinfected and renovated before it can be used again.

Where the requirements of the regulations are not carried out by the owner or occupants of the apartments, a placard must be posted stating that tuberculosis is a communicable disease, and that the apartments can not be occupied until disinfected or renovated.

It is unlawful for any person having pulmonary tuberculosis to dispose of the sputum, saliva, or other secretions or excretions so as to cause offense or danger to another person. A person violating this law is guilty of a misdemeanor.

Active tuberculosis or other communicable disease is sufficient cause, under the law, for the suspension of the certificate of any teacher.

Requirements of regulations.—A summary of the regulations for the control of tuberculosis is as follows:

Where the patient is not taking the proper precautions the house must be placarded to the effect that tuberculosis exists.

No person affected with pulmonary or glandular tuberculosis in the infectious stage is permitted to handle any dairy products or other food products likely to be eaten raw if such foods are offered for sale.

The infectious stage is, according to the regulations, the period or periods, following the positive clinical diagnosis of tuberculosis or the demonstration of tubercle bacilli in the sputum or other discharge, during which there is coughing with expectoration or during which there is a discharge through the mouth or from infected glands.

The law authorizing the establishment of sanatoria should be of great aid to the State in combating tuberculosis, as these sanatoria may be utilized for advanced cases which are a menace to the community. It is to be hoped that all counties will see the necessity for them and will construct them as soon as possible. It seems to be true that little effect is produced on the incidence of the disease when the cases are permitted to remain at home, for even those who are

most careful will almost certainly, without knowing it, disseminate tubercle bacilli. The county commissioners have the power to commit any patient to a sanatorium for tuberculosis who does not or can not take the proper precautions to prevent the spread of the disease. This is a wise provision.

The State board of health has recently outlined a comprehensive campaign against tuberculosis which will shortly be put into operation. It will include a survey of a county, instructions to all cases and isolation of open cases of the disease, and the hospitalization of patients who can not be adequately isolated at home. In lieu of a hospital for the purpose it will be necessary for the locality to employ a nurse in indigent cases. A strong effort will be made to induce the county commissioners to erect a sanatorium. In fact, it is to the financial as well as the health interests of the people of a county to have such a place in which to isolate tuberculosis patients, as they will then receive State aid, the expense being borne one-half by the county and one-half by the State. Otherwise the expense must be borne one-half by the county and one-half by the township.

It should be mentioned here that the antispitting ordinances of the State can be enforced only against those having tuberculosis.

"Follow-up" system.—The "follow-up" system as used in the division is applied to anterior poliomyelitis, cerebrospinal meningitis, typhoid fever, tuberculosis, and especially diphtheria and scarlet fever.

As the report received, notifying the division of any one of the first four diseases, does not contain all of the information necessary for thorough study, unless an epidemiologist of the division personally investigates the case, a supplemental report blank is sent to the physician requesting further information. Until the supplemental report is returned, properly filled out, the original report card is placed in a temporary or "daily reminder" file. When returned, the supplemental is attached to the original report, which is placed in a permanent file after all necessary action has been taken. Poliomyelitis and cerebrospinal meningitis are seen by an epidemiologist if one is available.

Circulars of information and instruction to physicians, patients, and contacts are sent out to the attending physician immediately upon the receipt of a report of tuberculosis or of typhoid fever. In each case the present circulars are to be revised, making them of uniform size and incorporating the information in one circular instead of several circulars, as at present.

No supplemental information is required for tuberculosis at present, but there is about to be put into effect a system whereby certain cases will be followed up. All institutions will be required to report the admission and discharge of patients suffering from tuberculosis.

Upon admission, if the case has not been reported previously, the health officer will be communicated with and instructed to visit the family from which the patient came, to determine if there are any other cases of the disease present in the same household. The health officer will also be notified upon the discharge of a patient, so that he may be able to maintain proper supervision over such case. Whenever a physician reports a case of tuberculosis, if no sputum examination has been made by him within the year, he will be sent a sputum outfit so that he may submit samples for examination, and a circular letter of instructions will be sent direct to the patient instead of to the physician.

The "follow up" system as regards scarlet fever and diphtheria, two quarantinable diseases, is more intricate. A careful record is kept of the periods of quarantine and the time of release of patients.

In working out periods of quarantine a date-calculating machine devised by the chief of the division is employed. It consists of a dial about 16 inches in diameter with its circumference divided into 365 equal segments representing the days of the year and into 12 sectors representing the months of the year. Each sector representing a month includes as many of the segments as there are days in the months. A T-shaped arm pivoted at the middle of the disk moves around the circumference, covering about 44 day segments at one time. In it are cut 4 slits each the size of a segment, the first near the left edge and the others 21, 28, and 42 segments from the first. In using this machine the first slit is placed over the date of first appearance of symptoms, and the second, third, and fourth slits will then be over the date at which a three weeks, four weeks, or six weeks' quarantine would expire.

In scarlet fever the minimum period of quarantine of premises is three weeks after the date of appearance of first symptoms of the last case in the house.

All original reports of this disease are placed in a temporary file until the quarantine is raised, and the raising of quarantine must be reported by the local health officer upon a regular form known as the "quarantine release" card. Upon receipt this card is attached to the original report. The reports are gone through daily and periods of quarantine checked. If quarantine has been raised too soon, a letter is addressed to the health officer requesting information as to why the regulations were not followed. If the period of quarantine has expired and the health officer has sent in no "release card," a form letter is addressed to him requesting him to insert the necessary information as to the release of the patient. A stamped envelope accompanies this request, and upon its return properly made out it is filed with the original report in lieu of a regular "quarantine release" card.

In diphtheria the minimum period of quarantine without cultures is three weeks after the date of disappearance of all symptoms, which would mean, assuming that the case has received antitoxin, that the average time would be about four weeks from the appearance of first symptoms. No case may be kept in quarantine longer than six weeks after disappearance of symptoms.

For purposes of control, diphtheria patients have been divided into those living in cities and villages or within 2 miles of cities or villages, and those living outside of this limit. This distinction has been made because it is difficult for health officers to properly supervise patients too far removed from urban communities.

In the first instance patients must remain in quarantine for the maximum period unless two successive negative cultures from the throat and nose, taken not less than 24 hours apart, are obtained.

In the second instance, patients may be released from quarantine at the end of the minimum period of three weeks without the submission of cultures.

In either instance the finding of two successive negative cultures permits the release of the patient in less than the minimum period, and such negative cultures are always required before a patient, either pupil or teacher, may return to school.

No primary cultures are required except where the clinical diagnosis is in doubt. Physicians should, however, send specimens as a matter of routine not only to confirm their clinical diagnosis, but as a matter of self-protection against suits for having used antitoxin unnecessarily.

Upon the receipt of the notification of a case of diphtheria, either by a morbidity report card or through the laboratory, a letter is addressed to the physician, pointing out the regulations of the State board of health in the care of diphtheria. If the relation of a township case to the 2-mile limit or to school attendance is not given, a card is addressed to the health officer requesting this information.

Where the report of the release of the patient has not been received as required by regulation, a letter is addressed to the health officer requesting the information. The reply when received is filed with the original report in lieu of a proper "quarantine release" card.

Upon the finding of two negative cultures in cases outside of the 2-mile limit, a card known as "Health officer's certificate" is sent to the health officer authorizing the readmission of the patient to school if a pupil or teacher.

The management of diphtheria in public institutions is based entirely upon results of laboratory examinations. Cultures are taken from all persons presumably exposed to infection in the institution. Those having diphtheria, or being bacillus carriers, are rigidly quarantined. Upon obtaining the first negative culture they are released

from quarantine but segregated from the other inmates. Upon the obtaining of two more successive negative cultures, they are relieved from all quarantine restrictions.

A virulence test is always made where bacilli persist in the throat or nose for 30 days or longer. If the organisms are nonvirulent no further precautions are taken. If they are virulent, the carrier is prohibited from attending school or business. This virulence test is made as a routine matter in the case of all cultures taken after 30 days have elapsed from the date of appearance of first symptoms.

In outbreaks of diphtheria in a school, the method of handling is based to a large extent on the results of examinations of nose and throat cultures of all pupils and teachers in the institution. All those having the bacilli in nose or throat, and all contacts which can not be adequately protected by isolation of patients in the home, are excluded from school and carefully watched. Others are permitted to attend school.

The reports of findings of the laboratory are filed in the laboratory, notations being made on the original report card filed in the subdivision of epidemiology. When a case has been satisfactorily disposed of the original report, with the report of quarantine release, is taken from the running file and placed in a permanent file by county and disease.

All cards used in the division are of uniform size for convenience in filing.

Branch laboratories transmit daily the reports of all specimens examined by them and the cases are followed up as when reported by practicing physicians.

In connection with epidemiological studies information is always obtained as to the number of people who have developed the disease and left the locality for other parts of the State or for other States, and immediate notice is sent to the interested health officers, so that they can take the proper action without delay. This reciprocal notification is very important, especially to the health department of the locality to which the case went. On account of the efficient reporting of diseases, the follow-up system and prompt field investigations, the State of Minnesota is in especially good position to furnish this information.

Since the inauguration of the follow-up system a marked increase has taken place in the number of cases of diseases notified to the health department. In the biennial period of August 1, 1910, to August 1, 1912, before the system was in use, there were 16,436 cases of disease reported, while during the single year ended July 31, 1914, there were 20,292 cases reported.

Field investigations.—There are two epidemiologists engaged in field work, and they are kept busy all of the time. In addition, another epidemiologist has been provided for. The director of the division, who is himself an expert in epidemiology as well as bacteriology, and a special agent also carry on a certain amount of investigation in the field. Much of the director's time, however, is necessarily consumed in office work. During the year ended July 31, 1914, there were 250 investigations of this kind made in 63 counties. The investigations included studies of outbreaks of typhoid fever, scarlet fever, measles, smallpox, chicken-pox, diphtheria, poliomyelitis, and other diseases.

In reporting results of routine investigations an effort is made to be as brief as possible, and the report is always confined to one type-written page. A set form is followed, starting with a summary, then the authority, the reason for the investigation, the history of the outbreak, the activities of the inspector, the results of the investigation, and the time taken to complete it. Names are considered as confidential information, entered on a separate confidential sheet, and referred to in the report by initials only. A report can thus be published without mentioning any particular person. Any other information of a confidential nature is treated in the same way.

In addition to routine investigations, special studies have been carried on in the field relative to tuberculosis.

Two series of such studies were made, one by a special epidemiologist and one by a special agent. The epidemiologist was a physician, and the investigations were made from the standpoint of the physician, even to the use of the von Pirquet reaction for determining the presence of the disease in children. The special agent was not a physician, but was familiar with antituberculosis work from the standpoint of a layman. While he was unable to make the diagnosis in all suspected cases, he submitted samples of sputum from patients for examination in the laboratory. In both instances the results were somewhat similar. These investigations covered a territory comprising eight counties.

More recently, since the passage of the law providing for county tuberculosis sanatoria, a survey for tuberculosis was made in Blue Earth County, including the city of Mankato. The investigation in the rural communities is not quite completed. All families were visited who had had a death from tuberculosis in the last four years, or in which tuberculosis had been reported by a physician.

A summary of the results of the survey in Mankato City only is as follows:

Twenty-one families could not be located.

The number of families examined was 49, in 22 of which no further cases of tuberculosis were found. However, the deaths reported in 7 of these 22 fami-

Hes were due to meningeal or peritoneal tuberculosis, not dangerous from the standpoint of communicability as compared with pulmonary tuberculosis.

In 27 families, representing a total of 96 persons, there were 54 who showed evidence of pulmonary tuberculosis, 33 of whom were advanced cases, 14 moderately advanced, and 7 incipient. The diagnosis depended on physical examination. The von Pirquet reaction was not utilized.

In following up information given by the families examined, 27 unreported cases were discovered, 17 of which were open cases, and only 2 of these patients were taking precautions to prevent the spread of the disease.

Most of the families in which tuberculosis was present were unable financially to provide suitable treatment or isolation for the patients.

Bacteriological Work.

As previously stated, the bacteriological laboratories (main and branch) of the State board of health form a subdivision of the division of preventable diseases.

Duties of the bacteriological laboratory.—The laboratory, like other laboratories of its kind, assists the health officers in the diagnosis of communicable disease by the examination of culture materials and the like. It is also concerned with the manufacture and disbursement of antityphoid vaccine and the issuance of mailing outfits to physicians in order that they may submit specimens for examination. In the diagnosis of diseases the work is confined almost entirely to diphtheria, typhoid fever, and tuberculosis. Antitoxin for diphtheria is not issued by the State free of charge, and, although vaccine against smallpox may be so furnished, there is practically no demand for it, and it is therefore not kept in stock. Local authorities are expected to furnish it when necessary.

Mailing outfits.—There are four mailing outfits issued from the laboratory. The one for diphtheria consists of two tubes of Loeffler's blood serum, plugged with cotton and capped with a rubber cap. One of the tubes is intended for the nose and one for the throat swabbings. There is also a tube containing two sterile swabs. These are securely packed in cotton and inclosed in an approved mailing outfit, with instructions to the physician for taking swabbings, and with a card to be filled out with full data on the case. Experiments carried on by the laboratory have demonstrated that the use of swabs, as practiced in some States, is not productive of the best and most accurate results. In Minnesota it has been found that far better results are obtained from the use of blood serum inoculated at the bedside than by the inoculation of blood serum in the laboratory from nose and throat swabbings sent in from a distance. The results depend mainly upon the amount of drying which has taken place, and the swab, after inoculation, will dry out much quicker than the inoculated culture media. The uninoculated tubes of culture media are good for one year and will, in fact, stay in moist condition longer unless the rubber cap is broken.

The outfit used for sputum consists of a wide-mouthed bottle containing a small amount of 5 per cent carbolic-acid solution and stoppered with a cork. This is also placed in an approved mailing outfit with necessary instructions to the physician and the patient relating to the collection of sputum for examination. There is also inclosed a card to be filled in by the physician giving full data on the case.

The mailing outfit for specimens of dried blood for Widal reactions consists of an envelope inclosing an aluminum foil, necessary directions for the collection of the sample, and a card to be filled in with full data on the case. All data cards are of the same size as the morbidity report card, contain full information, and may be filed in lieu of an original morbidity report.

The outfit used in the case of cerebrospinal meningitis consists of a bottle with a rubber stopper, the stopper having two perforations. Through one perforation passes a glass tube, open at both ends, to the upper end of which is attached a rubber tube. Through the other hole passes a small glass tube closed at its upper end and perforated at its side by a small hole. This is merely for the purpose of permitting air to escape as the cerebrospinal fluid runs into the bottle, and when collected the small tube is pushed in, thus sealing the hole. The entire outfit is sterilized and protected by a cloth covering. When material is to be collected the cloth covering is removed, an aspirating needle is inserted into the spinal canal, and then attached to the end of the rubber tubing, and the outfit is ready for use.

Methods of procedure.—When specimens are received at the laboratory the culture tube or other container is stamped with a number, and a corresponding number placed on the data card. There is also made out a report blank, the clerk filling in the necessary information to identify the specimen and the bacteriologist inserting the diagnosis in writing over his signature after the examination is completed. The card, with its specimen, is then placed in a tumbler, and in the case of diphtheria the whole is put into the incubator. Ordinarily these cultures go into the incubator about 3 o'clock in the afternoon and are examined the next morning about 8. In examining them a long glass slide is used and a number of different specimens stained on the same slide, each being allotted its corresponding number. The type of organism is always specified.

Reports are made in triplicate, the original being filed in the laboratory, the duplicate going to the physician, and the triplicate to the health officer. If the report is on a culture submitted for release of quarantine, under remarks is placed either "First negative. Keep in quarantine," "First negative. Repeat test," "Final negative."

Patient may be released by health officer," or "Final negative. Issue health officer's certificate," depending on the circumstances.

In addition to the examination of cultures for *B. diphtheriae*, the organism is as a matter of routine tested as to virulence when it persists in the throat or nose 30 days or longer. Guinea pigs are used for the test.

All results of examinations of specimens from the same case are placed in a filing envelope, on the outside of which is all the necessary data for identification. Files are kept according to disease, county, and township, with names of patients in alphabetical order.

In the case of tuberculosis, after the specimen is stamped, it is taken immediately to the desk where the examinations are made by the bacteriologist. The modified method is not used, i. e., antiformin and legroin, it having been found in the laboratory that the benefits derived from this method are so very slight that they do not compensate for the extra work.

Blood specimens for Widal reaction are likewise taken immediately to the desk where the Widal reaction is determined, and the report and file are kept as in the case of other diseases.

Many routine investigations of stools are also made to determine the presence of "typhoid carriers," especially in institutional outbreaks.

Daily reports are kept, showing each specimen examined and the results.

It is suggested that all reports relating to the same case might well be filed together, these to include the original morbidity report as well as all laboratory reports.

The laboratory furnishes the media and sterilizes the glassware used in the division of sanitation in water, milk, and sewage analysis.

The laboratory is well equipped for any work that it may be called upon to do.

The routine work has greatly increased in the last year or two, and most of it is performed by the chief of the laboratory. There is sufficient work to occupy two additional bacteriologists.

Branch laboratories.—For the convenience of physicians and health officers, and at their request, branch laboratories have been established by the State board of health at Mankato and Duluth. The branch laboratories are also of great utility to the division of sanitation, in that they make examinations of water in the locality, such examinations being made under the general supervision of the division of sanitation.

The bacteriologist in charge of the branch laboratory at Mankato, who also acts as health officer for that city, receives a salary from the State board of health, a small salary from the city, and addi-

tional income from the practicing physicians for examining specimens from their private cases.

The bacteriologist in charge of the branch laboratory at Duluth receives a salary from the State board of health and a small salary from the city, although he is not under the control of the local health department. The State board of health is reimbursed for a part of its expense by receiving \$600 from the county, \$300 from the city health department, and \$300 from the city water and light commission.

Both laboratories are equipped and maintained by the State and come under the supervision of the director of the division of preventable diseases. Culture material is made in the main laboratory and sent to them from time to time.

These branch laboratories are a great convenience to the health officers in making it possible to secure prompt assistance in the diagnosis of communicable diseases and to practicing physicians in other diseases where laboratory investigations are necessary. They are of special assistance to physicians and health officers when they are established in communities located some distance away from the main laboratory.

The board at present has under consideration the establishment of a laboratory in Winona.

The forms used in the branch laboratories are practically the same as those used in the main laboratory. Reports on examinations of specimens from communicable diseases within the city in which the branch laboratory is located are made for the information of the local health officer and are therefore filed in the branch laboratory. Reports on cases outside of the city are forwarded to the division of preventable diseases.

Pasteur Institute.

Duties of the division.—The division is engaged in the preparation and administration of antirabic treatment and the diagnosis of rabies in animals.

Methods of procedure.—As the methods are highly technical, only a brief description would be proper in a report of this kind.

The virus used is a seven-day virus. Two rabbits are inoculated each day. A subdural inoculation is made, the scalpel being used both to make the incision through the skin and the puncture through the skull. The cord is removed, with its membranes, after performing laminectomy. It is cut into two parts and hung in jars containing potassium hydrate. A broth culture is made of each half from the substance and the surface of the cord. A cord is cut as needed and emulsified in salt solution before administering treatment.

Treatments are given according to the following scheme:

First day, 12 and 11 day cord.
Second day, 10 and 9 day cord.
Third day, 8 and 7 day cord.
Fourth and fifth day, 6-day cord.
Sixth day, 5-day cord.
Seventh day, 4-day cord.
Eighth day, 3-day cord.

Further treatments are given up to 21 days, using alternately 5, 4, and 3 day cords.

Cords are not preserved in glycerin. When a cord has dried for the maximum period, if not completely used, it is discarded. The jars containing the drying cord are placed in an incubator, which is cooled by circulating water at ordinary temperature.

In making diagnoses, smears of the hippocampus are stained with eosin and Unna's methylene blue. Sections are made and stained after hardening in Zenker's fluid.

When inoculations for diagnosis are necessary, rabbits are generally used, unless there happens to be a shortage of those animals, when guinea pigs are substituted.

This Pasteur Institute has been in existence since August 1, 1907, and has administered treatment to 1,258 persons, and in only 3 instances have untoward results followed: One, a case of general paralysis, one a case of general weakness amounting almost to paralysis, and one, an acute anaphylactic reaction coming on just after an inoculation had been given. All recovered. There have also been four cases of human rabies develop in spite of Pasteur treatment.

The local reaction following an inoculation is usually noticeable about the fifth to the seventh day.

The institute is adequately equipped for carrying on the work.

All residents of the State are entitled to free treatment. Others are required to pay into the State treasury a fee of \$100.

Animal house.—In connection with the Pasteur Institute there is maintained a separate brick building in which are kept all laboratory animals used either in the Pasteur Institute or in the main or bacteriological laboratory. It is a good sized two-story building, containing large and small rooms equipped where necessary with animal cages. It has recently been made rat proof by taking out all double walls, floors, ceilings, etc., and by the free use of plaster or cement where needed. In the basement there is a large incinerator used for burning carcasses of dead animals.

Discussion.—The activities that are being carried on by the division of preventable diseases are deserving of the greatest praise and encouragement both as to their scope and the methods pursued. It is

work of this kind, indicating an active health department, that will eventually succeed in eradicating the preventable diseases. This success would come quicker if the cooperation of the people and the legislators could be secured, for without their cooperation the epidemiologist has a difficult task. However, education will, in time, be the means of gaining this much-needed assistance.

The division is badly in need of additional funds and a larger field force, especially an adequate and capable district organization, each district to have a full-time district medical officer, paid by the State, who would have immediate supervision over local health authorities. He should have the necessary assistants. It would be his duty to supervise the work of the local authorities, to inspect the schools and pupils in rural districts, to follow up and take the necessary measures to control communicable diseases, to make epidemiological investigations and studies relating to child welfare, to require the reporting of diseases, births, and deaths, etc. It is the representative in the field that a health department must depend upon to enforce its regulations, and when such representatives are permanently located throughout the State by districts the work is done more promptly, more economically, and with the assurance that quicker results will be obtained.

Tabulation of the activities of the division of preventable diseases for the year ended July 31, 1914.

Number of investigations for—

| | |
|---|--------|
| Typhoid fever | 61 |
| Dysentery | 3 |
| Scarlet fever | 54 |
| Measles | 2 |
| Smallpox | 34 |
| Chicken-pox | 3 |
| Tuberculosis | 28 |
| Diphtheria | 26 |
| Poliomyelitis | 15 |
| Other diseases | 24 |
| Total | 250 |
| Number of counties comprised in the investigation | 63 |
| Number of days in the field | 418 |
| Total mileage traveled, exclusive of team or automobile | 36,843 |
| Total number of cases of disease reported | 20,292 |
| Number of diphtheria cultures examined: | |
| Main laboratory | 15,288 |
| Branch laboratories | 9,251 |
| Total | 24,539 |
| Number of virulence tests made, main laboratory | 180 |

Number of Widal tests for diagnosis:

| | |
|--------------------------|--------|
| Main laboratory----- | 2, 145 |
| Branch laboratories----- | 852 |

Total ----- 2, 997

Number of Widal tests following vaccination, main laboratory----- 8, 003

Number of sputum examinations:

| | |
|--------------------------|--------|
| Main laboratory----- | 1, 791 |
| Branch laboratories----- | 1, 094 |

Total ----- 2, 885

Number of sputum inoculations for diagnosis of tuberculosis, main laboratory----- 35

Number of spinal fluid examinations, main laboratory----- 30

Number of cubic centimeters typhoid vaccine made and issued, main laboratory----- 17, 300

Number of units typhoid vaccine purchased and issued, main laboratory----- 523, 000

Number of animals used in diagnostic tests, main laboratory----- 453

Number of persons given Pasteur treatment----- 99

Number of examinations made for rabies----- 61

Number of rabbits used for treatments----- 730

Number of animals used for diagnostic and experimental work:

| | |
|------------------|-----|
| Rabbits----- | 118 |
| Guinea pigs----- | 40 |

Total----- 158

DIVISION OF SANITATION.

At the meeting of the State board of health held April 14, 1914, it was decided to separate the water and sewage work from other laboratory work and combine it with the work conducted in what was then known as the engineering division, thereby creating a division to be known as the division of sanitation. This was a wise rearrangement, as it places the work of the analytical chemist and the sanitary engineer under the control of one head. It would seem, however, that a more dignified and comprehensive name for the division might be the division of sanitary engineering, such name indicating activities involving larger engineering problems in which the division is engaged.

The personnel of the division and their respective salaries at present are as follows:

| | |
|---|----------|
| 1 director of division (part time)----- | \$1, 700 |
| 1 assistant director of division----- | 3, 000 |
| 1 chemist----- | 2, 100 |
| 1 laboratory aid----- | 900 |
| 1 consulting engineer (part time)----- | 2, 800 |
| 1 sanitary engineer----- | 2, 100 |
| 1 clerk and stenographer----- | 960 |
| 1 stenographer----- | 720 |

Duties of the division.—The division has under its charge the enforcement of laws and regulations relating to the control of water supplies and the disposal of sewage, garbage, and trade wastes, including the abatement of nuisances. In addition to this, it has been delegated to enforce the regulations which the State board of health has promulgated relating to the milk supply. Its duties are both analytical and constructive; i. e., those of the laboratory worker and the engineer.

Requirements of law.—The following is a summary of the law giving authority to the board of health to make regulations covering the subjects relating to the work of the division of sanitation.

The State board of health may adopt, alter, and enforce reasonable regulations relating to—

The business of scavengering.

The disposal of sewage.

The pollution of streams and other waters and the distribution of water by private persons for drinking or domestic use.

The accumulation of filthy and unwholesome matter to the injury of public health, and the removal thereof; and

The construction and equipment, in respect to sanitary conditions, of schools, hospitals, almshouses, prisons, and other public institutions, and of lodging house and other public sleeping place kept for gain.

The regulations that have been promulgated under the above authority and that are at present in force, together with any further law on the specified subjects, will be summarized and the activities of the division discussed under the following headings: Control of water supplies, disposal of sewage, trades wastes, offensive trades and nuisances, disposal of garbage, construction and equipment of public institutions, and industrial hygiene.

Control of Water Supplies.

Requirements of law.—The following is a summary of the laws enacted to maintain the purity of water used for domestic purposes:

No sewage or other matter dangerous to health may be deposited where it is likely to contaminate the water of any pond or stream used for domestic purposes. The State board of health has general charge of all water so used, and must take the necessary steps to prevent its pollution, and has the power, without a hearing, to require that its orders be obeyed.

The person so ordered, however, may appeal to the district court within five days after the order has been given. Pending the decision of the appeal the act causing the pollution must be discontinued, and if the order is not obeyed under these circumstances the appeal is forthwith dismissed.

Every owner, agent, etc., of any waterworks furnishing water for public or private use is prohibited from permitting the appliances of the same to become in a filthy condition or in any condition liable to impair the health of the consumers of the water. There is provided a penalty of imprisonment in the State prison for not more than 10 years.

Requirements of regulations.—The following is a summary of the only regulation bearing on the subject of water:

When a drinking water supply is shown to be a positive or probable source of typhoid fever or other disease, it must be condemned either by the local board or the State board of health, and can not be used again until declared safe by the condemning party.

Methods of operation.—The division has been very actively engaged in a study of the water supplied to different communities within the State. Most of the studies have been carried on at the request of the locality. Investigations are made, expert advice is given, and assistance is rendered in the maintenance of water-supply systems.

A very excellent and extensive piece of work that has just been accomplished was the examination of the water supplies used by the different railroads in the State, the results of which appeared in the Public Health Reports of May 15, 1914. This investigation not only gave the division an opportunity to study water used by the railroads, but, inasmuch as many of them used the city water, it gave them an opportunity to study municipal water supplies as well. (Apparently Minnesota has been the only State to carry on such an extensive study both from the practical and the scientific point of view, and other States have lost an opportunity in not taking advantage of the regulations promulgated by the Federal Government requiring that railroads furnish a pure water supply to their patrons.)

In studying water, a sanitary survey, including the collection of samples, is made by trained men of the division, who begin the examination of the samples in the field before shipping them to the laboratory, where the analysis is completed. The laboratory men are trained not only in the chemistry but in the bacteriology and biology of water, so that all the analytical work is done in one division. This is probably the best arrangement, as the one who is responsible for the interpretation of results has all of the work under his immediate supervision. The division of preventable diseases, however, furnishes the media used in water analysis, for which it is reimbursed by the division of sanitation.

Opinions are given relative to any water only after a study of both analytical and field investigations. No analysis will be made unless the field investigation, including the collection of the sample, is conducted by an expert of the division.

The division has under supervision a number of municipal water supplies which have been installed upon its recommendation. Such supervision involves especially the efficiency of filtration and hypochlorite plants.

In many cases the hypochlorite plant has been installed as a temporary expedient only. When subsoil waters are used this is usually a simple matter, but the division aims to render the water perma-

nently safe by a proper construction of the well and the maintenance of cleanliness of the appliances and surroundings. When surface water is used it is recognized that filtration is usually necessary, with subsequent treatment by hypochlorite or liquid chlorine. However, after the installation of a hypochlorite plant in emergencies the results are so satisfactory and the expense is so small that communities are loath to go to further expense.

In the case of surface waters there is such a great variation in the amount of organic matter that it requires a more or less constantly varying amount of hypochlorite to produce satisfactory results. To provide for this variation a skilled operator is necessary at all times, and such a person a municipality will rarely employ. The supervision of hypochlorite plants by the division includes, therefore, the determination in the laboratory of the average chlorine in samples of hypochlorite to be used in any plant, as well as a periodic test at the plant as to the efficiency of the treatment.

Ice is occasionally examined, but, as in the case of water, only after a sanitary survey has been made and the sample collected by an expert of the division.

To test the chemical phases of the hypochlorite treatment a compact outfit¹ has been devised for use in the field. It consists of a case containing the necessary chemicals, burette, pipettes, flasks, etc. This outfit is of great practical utility, and its use can be recommended elsewhere where similar work is being performed.

The assistant director of the division has devised an emergency hypochlorite plant, compact, and therefore easy to ship and accurate in its results for use when it is necessary to immediately sterilize a water supply, as, for instance, in a water-borne typhoid fever epidemic. The mixing and two distributing barrels are obtained in the locality. The mechanical part consists of a mixing fan, with the necessary handle and gearing, which clamps to the top of the mixing barrel. The mechanism which controls the flow of solution is the unique portion of the apparatus. It consists of a small tank in which the solution coming from the distributing reservoir is kept at a constant level by means of a float and valve similar to that used in the flushing tank of a modern flush toilet. Through the bottom of this tank passes a tube containing a narrow slot, the opening of which can be controlled by a sliding valve arrangement operated by a thumbscrew at the top. The turning of this screw also operates a dial which indicates the degree of opening or, strictly speaking, the amount of hypochlorite solution which is passing out. The slot is self-cleaning, and is therefore in little danger of clogging. All valves are lined with hard rubber and other parts coming in con-

¹ H. A. Whittaker, *American Journal of Public Health*, vol. 2, No. 12.

tact with the solution are painted. The entire apparatus is packed in a small trunk made for the purpose, which also contains a can of hypochlorite and tools for installing the plant. It can be put into operation within an hour. A description of this device will appear in a technical journal, and it has been suggested to the inventor that a brief description might also be submitted for publication in the Public Health Reports.

For field work several other compact outfits have been devised. One is a traveling laboratory for waterwork. This has been described in an article appearing in the Public Health Reports for May 15, 1914. Agar plates for bacterial counts are made in the field and kept for four days at room temperature. This gives plenty of time for transportation to the laboratory. An agar shake of 1 cubic centimeter of the water is obtained, which, after it reaches the laboratory, is planted in fermentation tubes to show gas formation in 1 cubic centimeter of water. In addition a 100 cubic-centimeter sample of the water is collected, enriched, and a portion finally planted in a fermentation tube. This is to show any gas formation in 100 cubic centimeters of the water. If there is gas formation, a portion is plated on lactose litmus agar and acid-producing colonies are run through the common media before pronouncing *B. coli* present. Tests are also made as to motility, morphology, etc. Synthetic milk medium¹ is used instead of the ordinary medium and gives very satisfactory results in waterwork. This same medium is also used in the bacteriological laboratory of the division of preventable diseases with good results.

Another field outfit consists of an incubator heated by a kerosene lamp, the degree of heat being regulated by a thermo-regulator of the ether type. This operates on a small door, which opens or closes as the temperature falls or rises, and permits the heat either to pass into a radiating chamber or out through the chimney. It is of great utility in the field in making rapid determinations as to the presence of *B. coli* in water under investigation. The presumptive test only is made use of in this case. The incubator is also large enough to hold plates if necessary.²

An additional field outfit consists of a box containing two glass-stoppered bottles for collecting samples of water for chemical examination only.

Disposal of Sewage.

Requirements of regulations.—The following is a summary of the regulations relating to sewage disposal.

¹ H. A. Whittaker, American Journal of Public Health, March, 1912.

² H. A. Whittaker, American Journal of Public Health, vol. 2, No. 12.

When typhoid fever is present in a community, the local board of health must appoint such inspectors as are necessary to patrol the locality and report all water-closets and privies which are not fly proof, and all vaults and cesspools which are not water-tight, dark, and fly proof. Local boards of health must then issue the necessary orders to remedy conditions.

Human excreta in cities and villages must be deposited in sewers, cesspools, or vaults. The cesspools and vaults must be made water-tight and fly proof.

They must be cleaned out at least once a year and at such other times as may be deemed necessary by the local health officer.

It is prohibited to use any abandoned well or deep well as a receptacle for sewage or household waste.

Methods of operation.—In regard to sewage disposal, the division of sanitation does not usually take the initiative, but acts only upon the request of a municipality, unless the matter is brought to its attention through the contamination of a water supply or by reason of the creation of a nuisance. Under any of these circumstances the division undertakes to make a thorough study of the situation and give the necessary advice, after which it expects prompt action on the part of local authorities.

It is not permitted to discharge sewage into streams too small to properly dilute it without previous treatment. The Imhoff tank, with or without preliminary or subsequent treatment, is generally recommended for this purpose. When the volume of water is sufficiently large to insure adequate dilution, the division recognizes the fact that it is more satisfactory and economical to treat the water before it is consumed than to treat the sewage before it is discharged.

When sewage is discharged into small streams which are sufficiently large to carry away the sewage without offense, but the said streams pass through pasture land used for grazing milch cows, which may result in the contamination of the milk by cows wading in the water, the State board of health urges the installation of a disinfection plant.

All available plans of sewerage system are filed in the division.

There is about to be started an analytical investigation of the comparative efficiency of sewage purification plants in the State.

Trades Wastes, Offensive Trades and Nuisances.

Requirements of laws.—The following is a summary of the laws bearing on the subject:

A nuisance is defined as anything which is injurious to health or indecent or offensive to the senses or an obstruction to the free use of property so as to interfere with the comfortable enjoyment of life or property.

A public nuisance is defined as a crime against the order and economy of the State and consists in unlawfully doing an act or omitting to perform a duty, which act or omission annoys, injures, or endangers the safety, health,

comfort, or repose of any considerable number of persons; likewise, other things which have no bearing on public health and which will not be mentioned.

Anyone who commits or maintains a public nuisance, refusing to remove the nuisance or permitting the use of a building for committing or maintaining a nuisance, is guilty of a misdemeanor.

No person is permitted to deposit unwholesome substances, dead animals, or offal on or near highways and public routes of travel on land or water, or establish offensive trades in such places, a fine of \$100 or imprisonment in the county jail for not less than three nor more than four months being provided for violations of the law.

Where any person engages in any trade or employment which is dangerous to the health of the community, or injurious to neighboring property, without a permit from the local board of health, or in any place prohibited by law, the State board of health, upon written complaint, is authorized to give the necessary hearing and order the exercise of the employment stopped. There is provided a fine of \$100 for each day that the employment is continued after the order has been given.

The person against whom the order is issued has the right of appeal. Pending the appeal the employment must not be carried on. If it is, the appeal is forthwith dismissed.

Requirements of regulations.—The following is a summary of the regulations:

Those engaging in any of the businesses mentioned below must secure a permit from the local board before they can be carried on, and the permit must state the location where the business may be operated. Dairies, slaughterhouses, butcher shops, creameries, feeding yards for stock, livery or boarding stables, rendering establishments, and other offensive trades or businesses are included in the provision.

Creamery wastes or washings must not be discharged upon the surface of the ground or upon low places or into bodies of standing or stagnant water.

The manufacture into any article of commerce from any part of an animal's carcass slaughtered when not in good health, or from butchers' offal, or from any unwholesome or decaying animal matter is prohibited. Butchers' offal is defined as any meat, tallow, fat, fish, scraps, bones, etc., which have become decayed or which have been put into unclean receptacles.

Any person wishing to manufacture material of this kind into an article of commerce other than food must apply to the State board of health for a license, stating the location of his proposed place of business, the articles he proposes to produce, and the animal material he intends to use. Upon such application the State board of health must inspect the location and, if properly located and equipped, in a room or building where no article of human food is produced, such license may be granted upon the payment of a fee of \$10. The license expires on the 1st day of July and may be renewed upon the payment of a fee of \$5. It holds good for one year.

Slaughterhouses must have an abundant supply of pure water; the floors must be water-tight and washed every day after slaughtering is completed; the walls and exposed places inside must be cleaned by washing or scraping as often as necessary. Painted walls must be repainted at least once a year, otherwise they must be whitewashed or calcimined at least once a month. Refuse must be removed from the slaughterhouse on the day of slaughtering and properly disposed of.

Feeding of hogs or other animals with offal is absolutely prohibited. Animals in the yard of the slaughterhouse must be treated humanely and, if kept over 12 hours, must be properly fed and watered.

Pens and inclosures must be kept in a sanitary condition.

The slaughtering of animals can not be done except in buildings designed or suitable for the purpose, nor can animals be slaughtered outside of any building except in rural districts and for private consumption.

Cooling and storage rooms for meat must be properly ventilated.

Carcasses of dead animals must not be left unburied nor thrown into any stream, lake, pond, etc. Carcasses must be buried by the owner and covered with at least three feet of earth. Burial shall take place within 24 hours after death. If death is caused by some communicable disease, the body must be surrounded with quicklime. At municipal dumping grounds provision must be made for the immediate burial of dead animals, or in lieu of this they may be burned.

Methods of procedure.—In Minnesota the industrial waste which requires special supervision by the State board of health is that from creameries, which if not controlled gives rise to great nuisance and furnishes a breeding place for flies. The methods of control are not entirely satisfactory, and the Division of Sanitation is now engaged in a study looking toward a satisfactory solution of the problem. Experiments have been made with a tank of the Imhoff type somewhat modified to fit the conditions. The results indicate that better results can be obtained with this type than with the ordinary septic tank. Plans of a creamery tank of this type have been prepared for distribution upon application. These plans are accompanied by a letter of instructions.

Nuisances in general are not unlikely to become a greater nuisance to the health department before they are abated than they are to the individual who claims that his peace of mind and even his health are jeopardized. They have little or no bearing on the causation of disease, except indirectly in furnishing a breeding place for flies or mosquitoes or in harboring rats, and ordinarily should be handled by the local police department. In the abatement of a nuisance coming under the jurisdiction of the State board of health, where no technical problems are involved and only administrative action is necessary, the duty devolves upon the secretary; otherwise it is referred to the Division of Sanitation for action.

Disposal of Garbage.

Requirements of regulations.—The following is a summary of the regulations bearing on the subject of garbage:

Garbage is defined as the accumulation of animal or vegetable matter from kitchens, pantries, dining rooms, or other parts of hotels, restaurants, boarding houses, tenement houses, dwelling houses, public institutions, market houses, fruit and vegetable stores, commission houses, and grocery stores.

Garbage must be collected in cities and villages in water-tight receptacles with closed tops. When the city or village collects the garbage the householder must provide a suitable container of convenient size to be handled by one man.

Where garbage is used in feeding hogs or other animals it must not be more than 48 hours old at the time of feeding. If used for feeding, it must be kept in water-tight boxes or cans under cover. The containers must be scalded at least twice a week between April 1 and October 1 and once a week during the rest of the year.

Garbage must be fed on or over water-tight floors at least 1 foot from the ground, with water-tight sides to the height of 1 foot above the floor. Pens and floors so constructed must be approved by the local health officer or by the State board of health.

Methods of operation.—While there are certain regulations on the subject of feeding garbage to hogs and the type of container to be used, no effort has been made to require municipalities to provide for an adequate system of garbage collection and disposal. It is thought that the State could be of great assistance to localities desirous of installing such a system by studying the question as applied to the State of Minnesota, and having on hand plans, figures of cost, and the like that they could use as a basis for giving expert advice.

Construction and Equipment of Public Institutions, Lodging Houses, Etc.

Requirements of regulations.—The regulation requiring that plans for public buildings must be approved by the State board of health, as well as those promulgated to regulate the construction and equipment of lodging houses, is as follows:

All plans and specifications for proposed school buildings, hospitals, almshouses, prisons, or other public institutions, must be submitted for approval and filed with the State board of health. No such building can be constructed until the sanitary arrangements have been approved by the board.

A lodging house is defined as any house or building or portion thereof provided with sleeping quarters arranged on the cubicle plan, i. e., with dividing partitions that do not extend to the ceiling, or with sleeping quarters arranged on the dormitory plan, and in which persons are lodged for hire.

All buildings used for this purpose after May 1, 1910, must receive a license from the local health officer.

The application for such license must contain the name and address of the proprietor, the location of the lodging house, and what portion of the house it is intended to use for the purpose.

With this application must be filed a certificate from the local authorities governing the construction of the building, and from the fire department.

After application, the proposed lodging house must be inspected within 10 days, and a report made as to the character of the building, water service, sewerage system, number, location and dimensions of sleeping rooms, outside windows, number of water-closets, wash basins, etc.

For the issue of a license there is required a fee of \$2 for a lodging house containing not to exceed 10 beds, with 10 cents extra for each additional bed.

Annually thereafter there must be paid a similar fee for renewal of the license, provided the proprietor has complied with the regulations.

Such lodging house must be examined two weeks after the issuance of a license and at least once a month thereafter.

This license must be displayed within the lodging house.

It is valid only for the premises and for the period stated in the license.

It is unlawful to put more than the permitted number of lodgers in any room.

Sleeping rooms must be adequately ventilated in such a manner as to be beyond the control of the lodgers.

The minimum floor area required for a sleeping room is 60 square feet, and there must be not less than 400 cubic feet of air space per bed.

Beds must be at least 2 feet apart, with free circulation between them.

After May 1, 1910, it is not permitted to place beds or bunks one above the other.

From 10 a. m. to 2 p. m. all windows must be kept open 1 foot from top and 1 foot from bottom, except in extremely cold weather.

Beds must be turned over and exposed to the air daily for four hours.

To accommodate lodgers working at night special beds or rooms must be set apart. They must be treated the same as other beds.

For each lodger there must be provided a separate bed, bedding, etc. Mattresses must be provided with water-proof covering. Beds, bed clothing, etc., must be kept free from vermin. Clean sheets and pillow cases must be furnished at least once a week and as often as a new lodger occupies the bed.

Frames of beds must be of metal.

Partitions of cubicles must not extend higher than 7 feet above the floor nor less than 1 foot from the ceiling, with a space of least 6 inches between the partition and the floor.

There must be at least one water-closet on each floor in the proportion of 1 seat to every 15 beds or less. Water-closets must be adequately ventilated and have self-closing doors and no odors allowed to escape, nor shall such compartment be used as a sleeping room.

There must be at least one wash room on each floor, in which there are basins with running water, in the proportion of 1 to every 10 beds or less.

There must be shower baths in the proportion of at least 1 to every 50 beds or tub baths in the proportion of 1 to every 25 beds or less.

Baths must be provided with hot and cold water accessible for use of the lodgers free of charge.

There must always be provided an adequate supply of water and clean towels.

The walls of water-closet compartments, wash rooms, etc., must be constructed of waterproof material at least 4 feet above the floor.

Lodging houses must be kept free from filth, dirt, vermin, garbage, etc.

Closets, basins, fixtures, etc., must be kept thoroughly clean.

Floors, ceilings, etc., must be kept in good repair and scrubbed or wet swept at least once daily.

If walls and ceilings are painted, they must be thoroughly washed with soap and water at least twice yearly.

An adequate number of cuspidors must be provided. Spitting is forbidden except in the proper receptacle. A sign to this effect must be hung on the wall. Cuspidors must be made of durable material, cleaned, and disinfected at least once daily, and must contain disinfecting solution.

Sleeping rooms and lodging houses must be fumigated at least once every two weeks to the satisfaction of the local health authorities. Disinfection of premises, furniture, etc., must follow the death of a lodger from a communicable disease.

Illness must be reported to the health authorities.

Except in lodging houses where there are rooms for the separation of the sexes, no woman or girl shall be lodged, nor any boy under the age of 16 unless accompanied by his father or guardian.

A separate room must be kept for lodgers who may become ill.

It is the duty of any person having knowledge that a lodging house is not being kept in conformity with the regulations to report the facts to the local health authorities.

If the requirements of the regulations are not being carried out, the local health authorities must notify the proper person and direct that the defects be remedied within a period not to exceed 30 days.

Failure to comply is sufficient cause for revocation of the license.

Methods of operation.—The law and regulation requiring the submission of plans of public institutions for approval is generally ignored by the board of control, a body appointed by the governor to supervise the construction of State buildings. Advice regarding the disposal of sewage is occasionally asked and sometimes followed.

With reference to the approval of plans for school buildings, the authority of the State board of health is limited to the character of toilets, the water supply, and the method of disposal of sewage. Otherwise, the matter is entirely in the hands of the school authorities. Here, again, the law is generally ignored and plans are rarely submitted.

This indicates a lack of interdepartmental cooperation which could be readily adjusted by the proper authorities. Plans of county tuberculosis sanatoria are always submitted for approval, there being a specific provision for this in the law authorizing the construction of county sanatoria.

The regulations governing lodging houses were promulgated by the State board of health for the benefit of municipalities of 10,000 population or over. They must be enforced by local authorities or used as a standard by municipalities desirous of making their own regulations.

Control of Milk Supply.

The enforcement of laws and regulations relating to food, including milk and creamery products, has been placed under the control of the State dairy and food department. As these laws and regulations do not contain any provision for certified and inspected milk, the State board of health promulgated a regulation setting forth a standard which, with the regulations relating to the sale of milk from places where communicable diseases exist, is summarized as follows:

Dairy or food products which may be eaten uncooked must not be sold or given to any person from a house where diphtheria, scarlet fever, typhoid fever, or smallpox exists, nor may any person resident in such house handle any of these products to be offered for sale. If the disease occurs on a farm the sale of its products is forbidden except when those having to handle the food sleep

away from the infected house and have no connection with any person coming from that house.

A regulation of the State board of health states that certified milk must be free from pus and injurious bacteria; must not contain more than 10,000 bacteria of any kind to the cubic centimeter at the time of delivery to consumers; must have a specific gravity ranging from 1.029 to 1.034; must be neutral, or at most but faintly acid in reaction; must contain not less nor more than 3.5 to 4.1 per cent proteids, from 3.5 to 4.5 per cent butter fat, and from 4 to 5 per cent sugar. It must be free from all contaminating foreign matter or chemical substances added for preservative or coloring and must be cooled immediately after milking and kept at a temperature of less than 50° F. until delivered to consumers.

Cows from which certified milk is obtained must be under rigid veterinary supervision and must be free from tuberculosis or other diseases.

All persons concerned in handling certified milk must be free from any communicable disease.

Inspected milk is defined as milk having not more than 100,000 bacteria per cubic centimeter at the time of delivery and conforming in all other respects to the requirements for certified milk.

The power to enforce the above regulations was vested in the laboratory division before the reorganization took place, and has been retained in the division of sanitation since that reorganization. While it makes little difference what particular division exercises the function of control, as long as this is done properly, it would seem to be more logically a duty of the division of epidemiology.

It is perhaps as well that the State board of health is not encumbered with the enforcement of the pure food law. Pure milk, however, is so essential in preserving the health of infants, as well as adults, that it would seem that the power of enforcement of all laws relating to milk would logically belong to that board. However, the State dairy and food commission has taken up the question actively, not only from the standpoint of public health, but from the standpoint of improvement in the quality and cleanliness of creamery products, which is the economic point involved. This commissioner has \$60,000 a year to spend in the enforcement of the food law, and, for this reason, is at present in a better position to supervise the milk supply than would be the State board of health, which receives but \$66,500 a year, only a small part of which could be devoted to that purpose.

That part of the food law which refers to milk is summarized as follows:

No person shall sell or knowingly buy unwholesome or adulterated cream. Milk and cream are held to be unwholesome or adulterated if they have not been well cooled and aerated; if preservatives have been added; if the milk has been drawn from cows kept in overcrowded places or places not well ventilated or lighted, filthy, or insanitary; if from unclean or diseased cows or those fed with distillery wastes, brewers' grain, etc., garbage or decayed substances, except ensilage from properly managed silos; if the milk is obtained from cows within 15 days before or 5 days after parturition; if kept in or near

stables where any animal is housed, or a building attached to a stable where bad air exists.

The standard for cream is as follows:

It must be obtained from wholesome and unadulterated milk. The water and milk solids (other than butter fat) must not contain more than eight-tenths of 1 per cent of acid, and must contain 20 per cent or more of butter fat and no foreign thickening or coloring matter.

The standard for milk is as follows:

No normal ingredient must be removed nor any abnormal substance added, and it must not contain more than 87 per cent of water or less than 13 per cent of total milk solids, and not less than 3.25 per cent of butter fat.

It is prohibited to manufacture any food from unwholesome or adulterated milk or cream. A person producing milk or cream for market or exchange, etc., must not feed milch cattle with distillery waste or brewers' grains, etc.

Skimmed milk may be sold to makers of skim cheese or by a licensed dealer, if properly labeled "skimmed milk." It is prohibited to furnish skimmed or separated milk to patrons of a creamery who furnish milk thereto unless such skimmed milk or the whey from cheese factories is first pasteurized at a temperature of at least 180° F.

Every person selling milk or cream to be used in any municipal corporation, except for the purpose of supplying the same to a butter or cheese factory, must secure a license from the State dairy and food commissioner. The fee for such license is \$1 for each place or vehicle from which milk is sold. The license is good for one year, expiring on May 1.

This license may be withheld or may be revoked by the commissioner for refusal or failure to obey any lawful request or direction.

Every person delivering milk, cream, or ice cream in cans or other vessels must keep such vessels clean, and the person to whom sold must thoroughly clean the can before returning same. It is also unlawful to sell sour milk or cream unless it is properly labeled.

Inspectors of the dairy and food department are authorized to visit all places where dairy products are made, stored, etc., or where cows are kept by persons engaged in the sale of milk and cream, and may require the correction of all insanitary conditions and practices found. Any person refusing to obey a lawful order is deemed guilty of a misdemeanor.

Local authorities are authorized to appoint inspectors for the purpose of maintaining the purity of a milk supply.

Adulterated ice cream is ice cream which is made from impure milk or cream, or to which any unwholesome substance, coal-tar dye, or saccharin has been added, or which contains less than 12 per cent by weight of butter fat, or colored, powdered, or damaged in any way to conceal inferiority.

A creamery which is equipped with machinery and appliances for pasteurizing, wishing to pasteurize milk and cream used to manufacture their products, must apply to the State dairy and food commissioner for a certificate. This is granted after an inspection. Milk and cream must be so pasteurized at a minimum temperature of 180° F. for intermittent or 140° F. for continuous pasteurization and the products may be labeled "products from pasteurized milk and cream."

The shipment of cream for distances of more than 65 miles on any railroad except when made in a refrigerator car, unless previously pasteurized, is prohibited.

Standards are also given for evaporated milk, condensed, skimmed milk, and sweetened condensed milk.

Industrial Hygiene.

By industrial hygiene is meant the maintenance of sanitation in places where labor is employed and the prevention of diseases among industrial workers.

In Minnesota, as in Maryland, the sanitary inspection and control of places of employment is in the hands of officials having no connection with the State board of health. This is certainly a mistake. A health department is concerned with the eradication of the preventable diseases which include communicable diseases, occupational diseases, and all maladies resulting from faulty environment. An investigation looking toward the improvement of the health and surroundings of industrial workers and which is confined to the factory alone would be most incomplete. To be of value it would require also studies outside the factories and in those fields in which public-health officials are already active.

Positive results can be expected only when all matters relating to the health of human beings are placed under the control of one body, namely, the department of health.

Records and reports.—The authority for making an investigation comes from the executive officer of the board, usually upon the request of the local authorities. The letter containing the request is forwarded to the division of sanitation with the authority.

Upon the completion of any field work a report is prepared which contains all of the essential information, including recommendations. Copies of this report are sent to the executive officer, with a memorandum of transmittal which contains the names of local authorities or other persons to whom copies of the report should be sent. The original is bound in permanent book form by subject, with a copy of the memorandum of transmittal and a summary of the results of any analyses that may have been made in the case. In addition, a copy of the report, together with the correspondence and results of analyses, is filed chronologically in a loose-leaf follow-up file.

At the end of 30 days a follow-up letter is sent to the local authorities, asking what has been done in following out the recommendations made in the report. If no satisfactory answer is received, a second follow-up letter is sent, and if this does not produce results the matter is referred to the executive officer for action.

When the necessary work has been performed as recommended and the subject is closed, the report, with its correspondence, is taken out of the follow-up file and placed in a permanent loose-leaf file. There are two permanent loose-leaf files, in one of which are placed all reports and correspondence relating to water, sewage, trades wastes, garbage, etc., and in the other reports and correspondence

on general subjects. The reports in both instances are filed by locality.

When further investigations are necessary, previous reports are consulted and copies taken from the loose-leaf file for reference. A receipt is given for them, and upon their return they are replaced in the file. Correspondence is never removed from the office.

When a report is completed a filing card is filled in. The information noted on this card includes a summary of the report, a number by which it can be identified in the permanent or loose-leaf file, a number of any plats, plans, drawings, etc., that may relate to the report which are filed in the plan file, the date on which the follow-up letter is to be sent, etc. This card is filed by county and sanitary district.

A letterpress copy is made of correspondence sent out by the division.

While there is no law or regulation requiring that plans and specifications of proposed installations must be submitted for approval, they are frequently furnished by the local authorities for the information of the division when it has been requested to make a study or investigation. Plans are filed separately and identified with reports on the same subject by number and letter. A separate filing card is made out for plans.

Results of the laboratory determinations are made on special forms, one containing full information on the results of the bacteriological examination of water and another full information on the results of the chemical examination of water or sewage. These are filed separately from the reports and are so numbered as to identify them with reports of field investigations on the same subject. In addition there is a complete summary of results made out on a special form, which is filed both with the bound copy of the report and in the loose-leaf file of reports.

For all samples of water and sewage collected for examination and examined either in the field or at the laboratory there is a special data card filled in, giving all essential information.

The results of analysis of embalming fluids or calcium hypochlorite, with full information relative to the source of the specimen, etc., are kept on separate cards and filed by number.

For the information of the director of the division there has been devised a filing-card system which is in the nature of an invoice of property and enables the one responsible to determine exactly what articles there are on hand in the division, their cost, etc. In addition to this a careful record is kept, on special forms, of all outfits delivered to field workers. Also a record is kept of apparatus or media furnished to the division by the division of preventable diseases.

Discussion.—The division is in need of either more comprehensive regulations or a law providing for the adequate control of water supplies and the disposal of sewage and garbage. This control should include the approval of all plans for proposed installations, the power to require necessary changes in existing installations, to require that such be maintained in a proper condition, and to compel a locality to provide for an adequate system when such does not already exist.

The existing law, which gives the State board of health the power to make regulations, specifically mentions the "business of scavenging" and the "disposal of sewage," and it is believed that there is here granted as much authority to promulgate regulations covering these subjects as there is to make regulations on the subject of quarantine and disinfection. The latter regulations are very comprehensive and have been upheld by the courts. It is therefore suggested that similar regulations be made with reference to garbage and sewage.

The same law also permits the State board of health to make regulations to prevent the pollution of water supplies and to supervise the distribution of water by private persons for drinking or domestic use. In accordance with a ruling of the Supreme Court of Minnesota, this latter provision of law would probably include municipalities furnishing water for drinking or domestic purposes, as a municipality engaging in such business is carrying out a private or corporate function and not a governmental function.¹

In any event, it would be advisable for a city or village, before installing a water supply, to consult the State board of health for expert advice, for the following reason: Not long since the city of Mankato had a widespread typhoid outbreak. Two widows sued the city for the death of their husbands, due to typhoid fever. It was proved that the epidemic was caused by the polluted water furnished by the city. From a study of a previous extensive outbreak of dysentery, the State board of health was cognizant of the polluted condition of the water and was, in a way, expecting a typhoid outbreak to follow. They had, however, no direct power to compel an immediate change in the water-supply system. The city argued that they could not be sued. The supreme court, however, ruled against the city, and while the cases were dropped, they were dropped only after a settlement had been made out of court.¹

If it is true that it is only necessary to prove that typhoid was contracted from the public water supply to make a city liable for loss of time or death resulting from the disease contracted in that way, it is of the greatest importance for local authorities to know

¹ Minnesota Reports, vol. 113, p. 55, *Della Kever v. City of Mankato*, etc.

that they are furnishing pure water so that they can not be implicated in court proceedings of this kind.

Trade wastes are important to the health department chiefly because they may become a nuisance. They can not of themselves be the cause of disease, although indirectly, by furnishing a breeding place for flies, they may be instrumental in carrying disease. The State board has ample powers, under the law, to prevent nuisances, and therefore can make regulations to govern the disposal of trade wastes.

If such regulations, promulgated under existing law, are not sustained by the courts, it is time to ask for more law on the subject.

During the year 1914 there were made 231 field investigations. Practically every problem on which the division is engaged requires field as well as analytical studies. There are four men engaged in field work, i. e., the assistant director of the division, the consulting engineer, the sanitary engineer, and the chemist.

The division is growing daily in scope and importance, and is now taxed beyond its capacity to carry on even the routine work requested by local authorities. The results obtained are lasting and of inestimable value to the citizens of the State in the prevention of typhoid fever alone. The work necessary to produce these results is being carried on with energy, and, like the work of the division of preventable diseases, is worthy of praise and encouragement, a larger force, and more money.

Minnesota State board of health, division of sanitation.

[Aug. 1, 1913-July 31, 1914.]

| Subject. | Investigations. | | Analyses. | | |
|--|-----------------|--------|--------------|--------------------|------------|
| | Localities. | Total. | Bio-logical. | Bacte-riolog-ical. | Chem-ical. |
| Water..... | 112 | 171 | 10 | 1,187 | 198 |
| Recommendations made to..... | 82 | | | | |
| Recommendations already complied with..... | 26 | | | | |
| Sewage..... | 42 | 54 | | 15 | 20 |
| Recommendations made to..... | 35 | | | | |
| Recommendations acted upon favorably or already complied with..... | 16 | | | | |
| Ice..... | 4 | 4 | | 10 | 5 |
| Milk..... | 2 | 2 | | 480 | |
| Plans, public buildings..... | 58 | 64 | | | |
| Hypochlorite samples..... | | | | | 19 |
| Embalming fluids..... | | | | | 10 |

Total number of miles traveled by field investigators, 31,992.

DIVISION OF VITAL STATISTICS.

The registration of births and deaths is under the supervision of an organized force of the State board of health, known as the division of vital statistics. At present its personnel and their respective salaries are as follows.

| | |
|----------------------------|-------------|
| 1 assistant registrar----- | \$1, 800 |
| 1 stenographer----- | 900 |
| 1 clerk----- | 1, 080 |
| 1 clerk----- | 840 |
| 2 clerks, at \$780----- | 1, 560 |
| 1 clerk----- | 420 |
| <hr/> 7 | <hr/> 6,600 |

Duties of the division.—The division of vital statistics is responsible for collecting, recording, compiling, and tabulating correct reports of births and deaths occurring in the State of Minnesota. It is also concerned with the enforcement of laws or regulations relating to the disposition of dead bodies and the practice of undertaking or embalming.

The Registration of Births and Deaths.

Requirements of law.—The vital statistics act of the State of Minnesota is patterned after the model law proposed by the Bureau of the Census and follows it very closely except in a few instances where it was necessary to make changes on account of local conditions. The following is a summary:

The State board of health has general supervision and charge of the registration of births and deaths and is empowered to make and enforce the necessary regulations.

The secretary of the State board of health is the State registrar of vital statistics. Each township, village, and city comprises a registration district. The clerk of a village or township and the health officer of a city are in each case, *ex officio*, the local registrars of vital statistics.

Each local registrar may appoint a deputy local registrar, for whose action he is responsible.

The State board of health may remove for cause any local registrar and appoint another in his place.

The State board of health may appoint, and remove for cause, subregistrars, to receive certificates of births and deaths and issue burial permits in a designated territory. They must note on each certificate the date of its filing with them, sign it and forward it to the local registrar of the proper district within five days after its receipt.

The subregistrars must also make monthly reports to the State registrar of all deaths where they have had charge of the remains or sold the casket.

The birth certificate is required to be filed with the local registrar within 10 days after the birth of the child by a physician or midwife, or the father or mother in the absence of an attending physician or midwife.

The law specifies fully the information which must be contained in the birth certificate.

In the case of plural births a separate certificate must be made for each child.

When a birth occurs in any institution, public or private, without the attendance of a physician, the person in charge must make and file the certificate. When the birth occurs in any hotel, rooming or boarding house, etc., without the services of a physician, the keeper or occupant is required to notify the local registrar, who then procures the necessary information.

When the child is not named a supplemental report must be left with the parents by the physician or the local registrar (as the case may be) to be filed in later. This report is required to be submitted within 30 days from the date of birth.

The undertaker or person acting as such must obtain and file with the local registrar a certificate of death.

The law specifies fully the information which must be contained in the death certificate.

The death certificate must be signed by the physician in attendance unless it is a case investigated by the coroner, when it is signed by him.

If death occurs without medical attendance, the health officer, the local registrar, or subregistrar signs the certificate, if able to determine the cause of death, and if not the certificate is referred to a physician or the coroner for certification. This provision includes stillbirths.

The death certificate must also be signed by the undertaker, giving the place and date of burial.

When the death occurs in a hospital or other institution the length of time at the place of death, length of time in the State, usual place of residence, and where the disease was contracted must be stated.

For stillbirths two certificates are required, a death certificate giving the cause of death as "stillborn," and a birth certificate with the word "stillbirth" inserted in place of the name, whether premature, and period of uterogestation. Such certificates are required only for a child that has advanced beyond the fifth month of uterogestation.

The local registrar notes on each certificate filed with him the number of his district, the serial number of the certificate (beginning with No. 1 for the first of each calendar year), the date when filed, post-office address, and signature. The certificates are recorded in a book kept by him and are then transmitted to the State registrar on or before the 10th day of the following month. If no births or deaths have occurred he forwards that statement to the State registrar.

The burial permit is issued upon the presentation of a properly filled out certificate of death. It is delivered to the undertaker, who in turn delivers it to the person in charge of the place of burial, or if the body is to be transported, to the person accompanying it. If the body comes from without the State the transit permit of that State may be accepted by a local registrar in place of a certificate of death and a burial permit issued.

All persons in charge of lying-in or other hospitals or institutions, public or private, must keep a record of the inmates, containing all information required, in filling out a birth or death certificate; and if admitted for medical treatment such information must include the nature of the disease and where it was contracted.

The State board of health is required to furnish free of charge all necessary blanks, forms, and books, except the books of record for the local registrars, which are furnished by the State but paid for by the city, village, or township comprising the registration district. The index book kept by the county clerk is also furnished at the expense of the county.

The State registrar is required to preserve all certificates and furnish all necessary instructions so that the recording of births and deaths can take place in a systematic and accurate manner.

Where any official or other person fails or refuses to furnish information, the State board of health may obtain the same and charge the expense of collection to the city, village, or township where the expense was incurred.

The local registrar receives for each birth and each death certificate the sum of 25 cents.

He receives for a card reporting no births or deaths the same fee, providing such card is received before the 15th of the following month and providing that no regular report is received later for the month to which the card applies.

Annually, on or before the 1st day of March, the State registrar transmits to the clerks of court of the different counties transcripts of all death and birth certificates received during the year from the county. The clerk files and indexes these certificates. The receipt of these certificates is authority for the county to reimburse the local registrar the amount due him. Except where the clerk is on a salary basis, he receives 5 cents for each certificate indexed.

All fees in connection with the collection of birth and death certificates are paid by the county.

The State and local registrars are authorized to issue certified copies of birth and death certificates and are entitled to a fee of 50 cents, to be paid by the applicant. A record of these fees is kept by the State registrar and they are paid over to the State treasurer.

For violation of any provision of the act relating to the registration of births and deaths there is provided a fee of not more than \$100 or imprisonment in the county jail for not more than 90 days.

County attorneys are required to make complaint and prosecute any person charged with the violation of the vital statistics act when the facts are brought to their attention by the State or any local registrar.

Every cemetery is required to have an actuary, who must keep a register of burials, containing necessary information, obtained from friends, physicians, undertakers, or public officials.

No dead body can be interred, removed from one district to another, or held for more than 72 hours after death unless and until a death certificate has been filed and a burial permit issued. No sexton may permit a burial or other disposition until a burial permit is received by him. The sexton must keep the necessary record of interment.

Requirements of regulations.—Certain regulations have been issued by the State board of health in order to make more explicit the requirements of the law and the procedure necessary to comply with it. They comprise the time for transmitting certificates, the signing of certificates, reports to be made, etc., and regulations for the transportation of dead bodies, which are taken up somewhat in detail as follows:

A transit permit in duplicate, containing information as to the name, sex, color, age, etc., terminal point and date and route of shipment, with date of issuance, is required for all dead bodies to be transported by common carriers. It must be signed by the undertaker and the official issuing the permit and contain the name of the escort or consignee. The original permit is fastened to the end of the coffin; the duplicate is sent to the official in charge of the baggage department and by him forwarded to the secretary of the State board of health. If the body is sent by express the original permit is attached to and accompanies the waybill and is delivered to the consignee. The duplicate is forwarded by the express agent to the State board of health.

Ticket agents before selling tickets are required to carefully examine the transit permit, note the name of the passenger in charge, and see if necessary precautions have been taken to prevent the spread of disease. Where bodies have died of communicable diseases the health officer or other competent authority at destination must be notified by telegraph.

Before shipment, bodies dead of smallpox, plague, Asiatic cholera, typhus fever, diphtheria, and scarlet fever must be embalmed with an approved disinfectant. The orifices of the body must be plugged, the surface washed with disinfectant, and the body enveloped in a sheet saturated with disinfectant and placed at once in a coffin. Either it or the outside case must be of metal or lined with metal and hermetically sealed.

For bodies dead of diseases other than those mentioned, a distinction is made depending upon whether they can reach their destination within 24 hours or longer. In the first instance the regulation describes the method of making the coffin and closing it, but does not require embalming. In the second instance the body must be embalmed.

The regulation prohibits the transportation of disinterred bodies without approval of the health authorities at the place of disinterment. A transit permit is required. Disinterred bodies must be inclosed in a metal-lined box and hermetically sealed.

Bodies in receiving vaults properly prepared by licensed embalmers are not to be regarded as disinterred bodies until after the expiration of 30 days.

No outside case is required when the coffin is transported in a hearse or undertaker's wagon.

Each outside case must have from four to six handles, depending on the size.

Collection and disposition of reports.—Local registrars and sub-registrars are authorized to accept birth and death certificates and issue burial permits. The local registrars are the town clerks, the village recorders, or the health officers, depending upon whether the registration district comprises a township, a village, or a city. The State board of health has nothing to do with the appointment of such officials, but may for cause remove them as local registrars and appoint substitutes. The subregistrars are, with few exceptions, the licensed embalmers. They are appointed by the State board of health. While all licensed embalmers have been asked to accept the position of subregistrar, a few have refused to act as such.

A local registrar may, with the approval of the State board of health, appoint a deputy to represent him, and a card indicating that a deputy has been so appointed must be filed with the State registrar. In this case the State registrar deals directly with the deputy.

Each local registrar transmits his certificates for the month direct to the State board of health on or before the 10th day of the following month. The subregistrar transmits his certificates to the local registrar of the district within five days after their receipt, and he is required to submit a monthly report to the State registrar giving the name, place of death, etc., of persons whose bodies he has buried and persons to whom he has sold a coffin. This enables the State board of health to keep a check on unreported deaths by comparing the names on these reports with the certificates of death that have been received from local registrars.

When no certificates have been received by the local registrar, he reports by postal to that effect, and if this postal reaches the board

before the 15th of the month he is entitled to a fee of 25 cents unless he should afterwards send in certificates of births or deaths for that month. The "no report card" is then canceled. All such fees are paid by the county. The local registrars of St. Paul and Minneapolis, however, do not receive reimbursement.

All certificates are paid for in full, even though they are incomplete, incorrect, or belated. By reason of the large foreign population of the State of Minnesota, some of whom speak and understand little or no English, it is difficult to secure all of the necessary information without great effort on the part of the local registrars. It is therefore deemed unfair to withhold full payment for such certificates, as to secure accurate data at all times the registrars would have to perform an amount of work in excess of the fee to which they are entitled and, if they were paid but one-half for incorrect or belated certificates, it is probable that their work would not be improved but that they would only be discouraged. No fees are paid to subregistrars.

Upon the receipt of a birth or death certificate in the vital statistics division it is stamped with the date of receipt, and if the death has occurred in a child under 1 year of age or is a stillbirth it is noted, that the records may be searched to determine whether the birth has been reported. At the same time it is also noted whether the locality has been correctly stated. The certificates of births and deaths are then pinned together and filed temporarily according to counties.

After the period has elapsed in which all certificates should be in, i. e., by the 15th of the following month, they are gone over carefully to discover missing or inaccurate statements and filed according to counties, one file being used for births and one for deaths. Those requiring further information are filed separately. A record of the total number of certificates received from each registrar is entered monthly in a book containing the name of the registration district and the name of the local registrar. The entry is made for the month in which the death or birth occurred, regardless of the date of receipt of the certificates in the division. Cards reporting no births or deaths are also recorded in this way. A separate column is used for belated reports that should have come in the pervious year or in former years. This record enables the division to determine with little effort whether the local registrar has made his reports for the month. If delinquent, he is notified accordingly. This record also makes it possible to quickly compile the registrations for any period during the year or the total registrations at the end of the year, for each registration area. Each certificate and "no report" card is checked when it has been accounted for in this book.

In requesting missing or obscure information a duplicate certificate is made out and blue penciled in the space where the information should be given. Upon the return of this duplicate the required information is entered on the original in red ink.

A number of form letters are in use which take up the particular items which are most often omitted or reported erroneously. In addition to this there are a great number of letters dictated covering more fully these points or others which are not mentioned in the form letters.

All letters of this kind are first addressed to the local registrar. If he is unable to supply the information a letter is addressed to the informant whose name appears on the certificate. When the information required relates to the cause of death the letter is addressed to the attending physician and a stamped envelope inclosed for reply.

When a form letter is used, its number and the date on which it is sent are stamped on both the original and duplicate certificate, so that it will be easy to locate the original when the duplicate is returned corrected. If the letter is dictated, a copy is attached to the original certificate and the original and duplicate are stamped with the date in a certain space on the certificate, indicating, when the duplicate is returned, that a special letter was sent out with it.

Certificates awaiting correction, and related correspondence, are filed in a "daily reminder" file arranged in alphabetical order by counties. All correspondence relating to vital statistics requiring further attention is also placed in this file. If at the end of the month there are matters in this file still needing attention further correspondence is carried on.

Correct returns and "no report" cards are filed in alphabetical order by registration districts and counties.

At times, physicians and embalmers, not knowing the name of the local registrar, send certificates direct to the State registrar. In this case a duplicate is sent to the local registrar requesting him to record, number, sign, and return it. The original is then placed to his credit.

In the past it has been customary, on or before March 1, to transmit on special forms a transcript of the certificates for the county received during the year to each clerk of a district court, together with an abstract of the number of certificates and "no report" cards received from each registrar. This transcribing has been the cause of a great deal of unnecessary work and was somewhat of a concession made to the clerks of court when the new vital statistics law was passed. Before 1908 all of the original certificates were filed with them. The new law requires that all original certificates shall be filed with the State board of health, but in order that the clerk of court might retain some of the fees which had previously been al-

lowed, it also requires that transcripts shall be made and sent to him, allowing him 5 cents for each one he indexes in a county record kept for that purpose.

An effort is going to be made to stop this procedure. Since the law allows the fee to be paid only to clerks on a fee basis, and as most of the clerks are at present on a salary basis, it is thought there will be little opposition to the change.

A full record of certificates is kept by local registrars in a book. Transcripts are not made by them. A duplicate in the shape of a stub for each burial permit issued is retained.

The death certificate is similar to that used in other States and cities within the registration area.

The birth certificate conforms to that specified in the model law for the registration of births and deaths. If it happens that the child has not been named before the birth certificate is sent in, a supplemental report is left with the parents to be filled out with the name of the child when a name is decided upon and returned to the State board of health within 30 days.

Deaths are indexed according to name of deceased, age, date of death, registration district, and the number of the certificate.

Births are indexed according to name of child, father and mother, date of birth, registration district, and number of certificate.

Birth and death certificates are bound and numbered separately at the end of the year in volumes of 500 certificates each. They are numbered serially, beginning with No. 1 at the beginning of the calendar year. In binding they are grouped alphabetically according to counties and registration districts, and date of birth or death.

The State and local registrars are authorized to issue certified copies of birth and death certificates, for which there is charged a fee of 50 cents each, which goes into the State treasury. Clerks of courts, by reason of their official position, are also empowered to issue certified copies of birth or death certificates.

Transit permits can be issued by only licensed embalmers. They are similar to those used by the State of Maryland, and consist of a physician's or coroner's certificate, a permit of the local board of health, and an undertaker's certificate, all in duplicate. The duplicates are presented to the transportation company and by them are transmitted to the State board of health. The originals are attached to the coffin. Regulations and instructions for the transportation of the dead are printed on the back of the originals. The blank permits are numbered serially and issued to licensed embalmers by the State board of health, and a record is kept of the serial numbers of the permits issued to each embalmer. This enables the State board, upon the receipt of a duplicate permit from a railroad

company, to determine whether a death certificate has been received, and if not, to communicate with the embalmer who prepared and shipped the body.

With respect to the registration of births and deaths the same procedure is followed in the larger cities, such as St. Paul, Minneapolis, and Duluth, as in other parts of the State. This is very desirable, but differs from the procedure in many other States where the large city is permitted to do largely as it pleases, as if it really were independent of State authority. By handling the certificates from large cities the work required of the State vital statistics force is increased two or three fold.

All registrars are encouraged to report irregularities in the registration of births and deaths, failures to report on the part of physicians, illegal burials, etc. Most of the burden, however, of securing accurate certificates falls upon the division of vital statistics. In fact, in order that the local registrar may not incur the enmity of any individual in his district which would impair his usefulness as a registrar, the division of vital statistics, under certain conditions, prefers to take up matters with the individual without mentioning the name of the registrar.

There are 2,532 registration districts in the State, each in charge of a local registrar. In addition, there are 46 deputies and 115 sub-registrars. In consequence the amount of correspondence carried on is very extensive. In the year 1913 there were 77,161 certificates and 7,097 "no report" cards, including those that were canceled, handled in the division, and the present study shows that the force of seven employees is not large enough to do the work expeditiously. In Maryland, where there are employed in the bureau of vital statistics seven persons, there were handled during the year 1913, 27,592 certificates, and this latter force even with the lesser number of certificates is kept continually busy.

Information.—For the information of local and subregistrars, manuals of instructions have been issued; also pamphlets containing the act relating to the registration of births and deaths.

For the information of the people a notice in English calling attention to the necessity for registering births and deaths has been printed as a poster. This would probably be of more value if it were printed in several languages.

For the information of the division a record is kept of all cemeteries, with name and address of persons in charge of same.

A record is also kept of the names of all persons comprising local boards of health, including local health officers.

After each township election a card is addressed to the town clerk, requesting him to inform the State board of health of the personnel of the township board of supervisors. In questions on vital sta-

tistics the State board of health deals with the town clerk, while in public-health matters it deals with the chairman of the board of supervisors, so that this information is essential.

A monthly record of deaths from the communicable diseases is furnished to the division of preventable diseases for its information.

Statistics.—The division of vital statistics makes use of the punch cards in compiling statistics, but for lack of funds has not been able to rent the sorting and counting machines, and, therefore, tabulations have to be made entirely by hand, which is a very tedious proceeding and liable to error.

Statistics of deaths from communicable diseases and accidental deaths are compiled monthly for cities of a population of one thousand or more, State institutions, and the rest of the State. These are published in the *Journal Lancet* of the State Medical Society. For the annual report much more detailed information is tabulated.

Unreported births and deaths.—The great majority of deaths in the State appear to be reported as required by law, but one can be fairly certain that a similar statement concerning births would not be true. Investigations in the field from time to time, including perusal of local papers, examinations of baptismal and hospital records, etc., nearly always discloses a number of unreported births. In many, if not the majority of instances, the physician is at fault, due too often to a lack of appreciation of the value of the birth record to the child and to the State.

Graduates of medicine before being granted a license to practice should be made to take affidavit that they will faithfully report all births, deaths, and diseases as required by law, and it should be with that understanding that the right to practice medicine is granted.

Table of information relating to birth and death registration in the counties of Minnesota, year ended December 31, 1913.

| Counties. | County number. | Registration districts. | Districts numbered from— | Birth certificates. | Death certificates. | Cards reporting no births or deaths. | Total births, deaths, and cards. | Amount expended in birth and death certificates. | Licensed embalmers. ¹ |
|-----------------|----------------|-------------------------|--------------------------|---------------------|---------------------|--------------------------------------|----------------------------------|--|----------------------------------|
| Aitkin..... | 1 | 51 | 1 to 51 | 329 | 89 | 176 | 594 | \$148.50 | 4 |
| Anoka..... | 2 | 17 | 1 to 17 | 254 | 154 | 26 | 434 | 108.50 | 4 |
| Becker..... | 3 | 38 | 1 to 38 | 575 | 209 | 66 | 850 | 212.50 | 2 |
| Beltrami..... | 4 | 65 | 1 to 65 | 627 | 265 | 259 | 1,151 | 287.75 | 7 |
| Benton..... | 5 | 18 | 1 to 18 | 336 | 102 | 44 | 482 | 120.50 | 2 |
| Big Stone..... | 6 | 21 | 1 to 21 | 216 | 84 | 26 | 326 | 81.50 | 8 |
| Blue Earth..... | 7 | 32 | 1 to 32 | 706 | 390 | 44 | 1,140 | 285.00 | 13 |
| Brown..... | 8 | 23 | 1 to 23 | 550 | 210 | 29 | 789 | 197.25 | 8 |
| Carlton..... | 9 | 26 | 1 to 26 | 520 | 179 | 52 | 751 | 187.75 | 5 |
| Carver..... | 10 | 24 | 1 to 24 | 377 | 189 | 36 | 602 | 150.50 | 6 |
| Cass..... | 11 | 46 | 1 to 46 | 299 | 162 | 166 | 627 | 156.75 | 1 |
| Chippewa..... | 12 | 22 | 1 to 22 | 391 | 150 | 27 | 568 | 142.00 | 7 |
| Chisago..... | 13 | 19 | 1 to 19 | 295 | 163 | 31 | 489 | 122.25 | 6 |
| Clay..... | 14 | 38 | 1 to 38 | 490 | 218 | 71 | 779 | 194.75 | 5 |
| Clearwater..... | 15 | 21 | 1 to 21 | 177 | 51 | 72 | 300 | 75.00 | 0 |
| Cook..... | 16 | 9 | 1 to 9 | 32 | 8 | 36 | 76 | 19.00 | 0 |
| Cottonwood..... | 17 | 24 | 1 to 24 | 378 | 108 | 32 | 518 | 129.50 | 3 |
| Crow Wing..... | 18 | 41 | 1 to 41 | 617 | 239 | 133 | 989 | 247.25 | 5 |
| Dakota..... | 19 | 32 | 1 to 32 | 648 | 333 | 46 | 1,027 | 256.75 | 11 |

¹ Licensed physicians, 2,252. Registered midwives, about 300.

Table of information relating to birth and death registration in the counties of Minnesota, year ended December 31, 1913—Continued.

| Counties. | County number. | Registration districts. | Districts numbered from— | Birth certificates. | Death certificates. | Cards reporting no births or deaths. | Total births, deaths, and cards. | Amount expended in birth and death certificates. | Licensed embalmers. |
|---|----------------|-------------------------|--------------------------|---------------------|---------------------|--------------------------------------|----------------------------------|--|---------------------|
| Dodge..... | 20 | 18 | 1 to 18 | 269 | 111 | 27 | 407 | \$101.75 | 4 |
| Douglas..... | 21 | 30 | 1 to 30 | 386 | 170 | 49 | 605 | 151.25 | 2 |
| Faribault..... | 22 | 31 | 1 to 31 | 437 | 173 | 36 | 646 | 161.50 | 11 |
| Fillmore..... | 23 | 36 | 1 to 36 | 523 | 286 | 46 | 855 | 213.75 | 19 |
| Freeborn..... | 24 | 26 | 1 to 26 | 507 | 215 | 30 | 752 | 188.00 | 11 |
| Goodhue..... | 25 | 30 | 1 to 30 | 596 | 334 | 37 | 967 | 241.75 | 15 |
| Grant..... | 26 | 23 | 1 to 23 | 213 | 70 | 55 | 338 | 84.50 | 3 |
| Hennepin, exclusive of Minneapolis..... | 27 | 39 | 1 to 39 | 642 | 313 | 53 | 1,008 | 252.00 | 98 |
| Houston..... | 28 | 23 | 1 to 23 | 292 | 156 | 28 | 476 | 119.00 | 6 |
| Hubbard..... | 29 | 31 | 1 to 31 | 261 | 116 | 110 | 487 | 121.75 | 6 |
| Isanti..... | 30 | 16 | 1 to 16 | 307 | 145 | 12 | 464 | 116.00 | 4 |
| Itasca..... | 31 | 48 | 1 to 48 | 617 | 202 | 162 | 981 | 245.25 | 11 |
| Jackson..... | 32 | 25 | 1 to 25 | 354 | 148 | 34 | 536 | 134.00 | 5 |
| Kanabec..... | 33 | 16 | 1 to 16 | 197 | 55 | 34 | 286 | 71.50 | 4 |
| Kandiyohi..... | 34 | 31 | 1 to 31 | 491 | 202 | 41 | 734 | 183.50 | 4 |
| Kittson..... | 35 | 34 | 1 to 34 | 243 | 78 | 114 | 435 | 108.75 | 2 |
| Koochiching..... | 36 | 40 | 1 to 40 | 256 | 130 | 157 | 543 | 135.75 | 4 |
| Lac qui Parle..... | 37 | 30 | 1 to 30 | 435 | 155 | 49 | 639 | 159.75 | 6 |
| Lake..... | 38 | 9 | 1 to 9 | 233 | 111 | 19 | 363 | 90.75 | 2 |
| Le Sueur..... | 39 | 24 | 1 to 24 | 348 | 185 | 27 | 560 | 140.00 | 11 |
| Lincoln..... | 40 | 20 | 1 to 20 | 279 | 90 | 31 | 400 | 100.00 | 3 |
| Lyon..... | 41 | 28 | 1 to 28 | 414 | 174 | 37 | 625 | 156.25 | 12 |
| McLeod..... | 42 | 22 | 1 to 22 | 455 | 170 | 17 | 642 | 160.50 | 11 |
| Mahnomen..... | 43 | 14 | 1 to 14 | 96 | 39 | 37 | 172 | 43.00 | 1 |
| Marshall..... | 44 | 55 | 1 to 55 | 518 | 183 | 171 | 872 | 218.00 | 1 |
| Martin..... | 45 | 30 | 1 to 30 | 484 | 144 | 40 | 668 | 167.00 | 11 |
| Meeker..... | 46 | 22 | 1 to 22 | 391 | 207 | 25 | 623 | 155.75 | 5 |
| Mille Lacs..... | 47 | 20 | 1 to 20 | 252 | 106 | 34 | 392 | 98.00 | 2 |
| Morrison..... | 48 | 40 | 1 to 40 | 593 | 214 | 95 | 902 | 225.50 | 5 |
| Mower..... | 49 | 32 | 1 to 32 | 541 | 249 | 48 | 838 | 209.50 | 14 |
| Murray..... | 50 | 28 | 1 to 28 | 355 | 109 | 49 | 513 | 128.25 | 4 |
| Nicollet..... | 51 | 18 | 1 to 18 | 289 | 213 | 24 | 526 | 131.50 | 2 |
| Nobles..... | 52 | 31 | 1 to 31 | 480 | 149 | 53 | 682 | 170.50 | 11 |
| Norman..... | 53 | 31 | 1 to 31 | 306 | 106 | 77 | 489 | 122.25 | 0 |
| Olmsted..... | 54 | 25 | 1 to 25 | 484 | 624 | 29 | 1,137 | 284.25 | 15 |
| Ottertail..... | 55 | 81 | 1 to 81 | 1,151 | 647 | 124 | 1,922 | 480.50 | 13 |
| Pennington..... | 56 | 23 | 1 to 23 | 303 | 103 | 63 | 469 | 117.25 | 4 |
| Pine..... | 57 | 41 | 1 to 41 | 434 | 158 | 121 | 713 | 178.25 | 4 |
| Pipestone..... | 58 | 19 | 1 to 19 | 259 | 87 | 33 | 379 | 94.75 | 2 |
| Polk..... | 59 | 70 | 1 to 70 | 781 | 357 | 186 | 1,324 | 331.00 | 10 |
| Pope..... | 60 | 27 | 1 to 27 | 304 | 135 | 52 | 491 | 122.75 | 1 |
| Ramsey, exclusive of St. Paul..... | 61 | 8 | 1 to 8 | 185 | 80 | 2 | 267 | 66.75 | 65 |
| Red Lake..... | 62 | 16 | 1 to 16 | 197 | 61 | 34 | 292 | 73.00 | 2 |
| Redwood..... | 63 | 42 | 1 to 42 | 508 | 150 | 90 | 748 | 187.00 | 6 |
| Renville..... | 64 | 37 | 1 to 37 | 604 | 200 | 43 | 847 | 211.75 | 6 |
| Rice..... | 65 | 22 | 1 to 22 | 480 | 363 | 22 | 865 | 216.25 | 7 |
| Rock..... | 66 | 18 | 1 to 18 | 306 | 105 | 24 | 435 | 108.75 | 6 |
| Roseau..... | 67 | 42 | 1 to 42 | 367 | 116 | 119 | 602 | 150.50 | 0 |
| St. Louis..... | 68 | 84 | 1 to 84 | 5,268 | 2,256 | 181 | 7,705 | 1,926.25 | 42 |
| Scott..... | 69 | 20 | 1 to 20 | 272 | 134 | 34 | 440 | 110.00 | 5 |
| Sherburne..... | 70 | 17 | 1 to 17 | 193 | 86 | 21 | 300 | 75.00 | 2 |
| Sibley..... | 71 | 24 | 1 to 24 | 370 | 148 | 26 | 544 | 136.00 | 10 |
| Stearns..... | 72 | 62 | 1 to 62 | 1,381 | 488 | 64 | 1,933 | 483.25 | 19 |
| Steele..... | 73 | 16 | 1 to 16 | 397 | 152 | 17 | 566 | 141.50 | 6 |
| Stevens..... | 74 | 21 | 1 to 21 | 230 | 78 | 48 | 356 | 89.00 | 5 |
| Swift..... | 75 | 29 | 1 to 29 | 383 | 135 | 55 | 573 | 143.25 | 10 |
| Todd..... | 76 | 39 | 1 to 39 | 613 | 227 | 55 | 895 | 223.75 | 9 |
| Traverse..... | 77 | 19 | 1 to 19 | 219 | 62 | 39 | 320 | 80.00 | 2 |
| Wabasha..... | 78 | 27 | 1 to 27 | 400 | 205 | 33 | 638 | 159.50 | 14 |
| Wadena..... | 79 | 19 | 1 to 19 | 230 | 100 | 45 | 375 | 93.75 | 1 |
| Waseca..... | 80 | 15 | 1 to 15 | 268 | 132 | 7 | 407 | 101.75 | 12 |
| Washington..... | 81 | 22 | 1 to 22 | 377 | 292 | 22 | 691 | 172.75 | 7 |
| Watsonwan..... | 82 | 19 | 1 to 19 | 312 | 109 | 26 | 447 | 111.75 | 5 |
| Wilkin..... | 83 | 31 | 1 to 31 | 279 | 101 | 82 | 462 | 115.50 | 2 |
| Winona..... | 84 | 28 | 1 to 28 | 742 | 443 | 59 | 1,244 | 311.00 | 8 |
| Wright..... | 85 | 36 | 1 to 36 | 622 | 315 | 36 | 973 | 243.25 | 18 |
| Yellow Medicine..... | 86 | 29 | 1 to 29 | 454 | 145 | 32 | 631 | 157.75 | 5 |
| Total..... | 86 | 2,546 | ..... | 40,250 | 17,605 | 5,054 | 62,909 | 15,727.25 | 730 |
| Minneapolis ¹..... | ..... | ..... | ..... | 7,450 | 4,135 | ..... | ..... | ..... | ..... |
| St. Paul ¹..... | ..... | ..... | ..... | 4,970 | 2,751 | ..... | ..... | ..... | ..... |
| Grand total..... | ..... | ..... | ..... | 52,670 | 24,491 | ..... | ..... | ..... | ..... |

¹ Certificates from Minneapolis and St. Paul are not paid for.

The Practice of Undertaking.

The licensing of embalmers was, from its inception, placed under the control of the State board of health. This provision, together with the methods of carrying it out, has enabled the State registrar to secure the cooperation of the licensed embalmers with regard to the reporting of deaths, and even births.

When licensed embalmers are appointed as subregistrars they are given a good deal of power, in that they may issue burial permits for bodies in their charge. If the State department of health did not have supervision over the licensing, this might result in a situation difficult to control. For instance, in certain epidemics it is advisable to inspect all dead bodies before they are buried or even embalmed for the purpose of detecting unreported cases. In order to see every dead body, it is necessary to withhold the burial permit until passed by the inspecting officer, and where the burial permit is granted by the undertaker it might be difficult to carry out such a procedure.

Requirements of law.—The following is a summary of the law relating to embalmers:

Every person or firm selling a casket is required to keep a record showing the name of the person to whom sold, his post-office address, name of deceased, date of death, and place of death. On the first day of each month a report of the sales for the previous month must be made to the State registrar, except where such sale is made to a dealer or undertaker, or where the person or firm is in charge of the disposition of the body.

If the person or firm selling the casket at retail is not in charge of the disposition of the body, there must be inclosed in the coffin a blank death certificate, copies of rules and regulations of the State board of health, etc.

No person is permitted to embalm a dead body without a license from the State board of health, and only a licensed embalmer may take charge of a body dead of a communicable disease. The license is obtained, after the necessary examination, upon the payment of a fee of \$5. The applicant must be at least 21 years of age, of good moral character, and with one year's practical experience in embalming. The license expires on the 31st day of July, and may be renewed for two years upon the payment of a fee of \$1.

The State board of health may, for cause, revoke or refuse to grant or renew any license.

Any person who embalms a body or claims to be an embalmer, without the required license, is liable to a fine of not less than \$25 or more than \$100, or imprisonment for a period of not to exceed three months.

Requirements of regulations.—Regulations have been promulgated by the State board of health stating explicitly the requirements to become a licensed embalmer and giving in detail the examination which the applicant is required to pass.

It further specifies that no railroad in the State can receive for shipment any dead body unless it has been prepared by a licensed embalmer.

A regulation of the State board of health also requires that for embalming a body for shipment there must be used not less than 8 parts by weight of embalming fluid to 150 parts of body weight.

In addition to this, where the persons have died from a communicable disease the surface of the body must be washed and the orifices plugged. The thorax and abdomen must be injected with the embalming fluid. Cancerous or other eroded surfaces must be bandaged and dressed.

Every embalming fluid must contain 5 per cent by weight of formaldehyde gas in every 100 parts by volume of the embalming fluid.

No chloral, arsenic, mercury, zinc, or other mineral poison is permitted in embalming fluids.

A list of the ingredients of every embalming fluid sold in the State must be filed in the office of the State board of health.

Methods of operation.—The State board of health appoints a board composed of five members, taken from names submitted by the State funeral directors association. A new member is appointed each year. When the time arrives to hold an examination of applicants for license, the president of the State embalmers association is requested to submit questions and from these the secretary of the State board of health selects those which he considers most suitable, or he may add questions to this list.

The examinations are held by the secretary of the State board of health, assisted by the board of embalmers. The examination is divided into three parts—a written examination of not less than 50 questions on the anatomy of the human body, technical subjects, transportation rules, disinfection, etc.; an oral examination on embalming, communicable diseases, and disinfection; and a practical examination upon the cadaver, which latter is held under the supervision of an official of the State university.

If the applicant passes the examination he is given a license by the State board and offered the position of subregistrar. He is under no obligation to accept this position if he does not care to.

The University of Minnesota has recently inaugurated a six weeks' course in embalming, which places the matter on a better and more scientific basis, and which might well be copied by other State universities. For this reason, after July 1, 1914, the State board of health will permit the university to assume entire charge of the examinations. In order to encourage those contemplating a study of embalming to take the university course, its graduates are given a license without additional examination, and \$5 of the fee of \$50 which students must pay for the course will be set aside by the university to pay for the license.

EXTENSION DIVISION.

The extension division is a newly organized division of the State board of health. Its director is the secretary of the board, and he has as his assistants a special agent, and the executive secretary of the Minnesota Public Health Association, whose duties in that associa-

tion are closely allied to the work of the new division. The salaries are as follows:

| | |
|---|---------|
| 1 assistant director of the division (part time)----- | \$1,000 |
| 1 special agent----- | 1,800 |

Duties of the division.—The duties of the division are educational in nature and devoted to the dissemination of popular information relating to public health, through circulars, bulletins, newspaper articles, lectures, and exhibits.

While the educational function of a health organization is most important, it has not been exercised as energetically and as extensively in Minnesota as the importance of the subject demands.

Requirements of law.—The law bearing on the duties of the extension division is as follows:

The board of health is empowered to "gather and diffuse proper information upon all subjects to which its duties relate." It is also empowered "to gather, collate, and publish medical and vital statistics of general value."

Bulletins, circulars, etc.—Except for the circular letter that accompanies the monthly morbidity reports sent to county auditors and to newspapers of the larger cities, no popular bulletin is issued by the State board of health. It was thought that by sending the report to county auditors the local newspapers would secure and publish the pertinent data. This did not work out as expected, so that at present this information appears only in the newspapers of the larger cities.

Formerly an arrangement was had with certain of the newspapers throughout the State whereby they would publish free of charge material furnished by the State board of health. This would seem to be a good idea, but has fallen into disuse.

The advisability of publishing a semimonthly bulletin to be issued to pupils of the public schools of the State and used as a text for their instruction should be carefully considered. Each bulletin should be a chapter, so that the year's bulletins, when bound together, would form a primer on public health worthy of the name.

It is unfortunate that many teachers are as much in need of public-health instruction as are their pupils. This indicates a weakness in the curriculum of the normal schools and universities which should be corrected.

Circulars on tuberculosis and typhoid fever for the information and instruction of physicians, patients, and contacts are in use by the division of preventable diseases, and circulars on other diseases are in course of preparation. In addition, the division of sanitation has in press bulletins comprising the subjects of farm water supplies and the disposal of sewage in rural communities.

Lectures and exhibits.—In the past popular lectures have been given from time to time by members of the different divisions of the

State board of health, but until 1913 no organized movement had been made in this direction except during the time the exhibit was on the road. During that year a course of lectures in public health was offered by the State board of health to the medical and the educational school of the University of Minnesota and to one of the normal schools. The university accepted the offer, but the normal school rejected it on the ground that their course of study was already decided upon and their available hours for lecturing were already filled. The secretary, the chief of the division of preventable diseases, and members of the staff of the division of sanitation gave these lectures at the university.

The exhibit was first shown in 1907 as an antituberculosis exhibit, but has been added to in recent years until it has become more of a general public-health exhibit and therefore of more general interest and value to the public.

The exhibit is made in the less populous cities and villages in a public building or other suitable place, an effort being made by interested local people to arouse enthusiasm among the citizens before the exhibit arrives. It consists mainly of charts and diagrams, but few models being used. Lectures with stereopticon views are given at each place by the official accompanying the exhibit, other officials of the State board of health, local doctors, or other persons of prominence. At each meeting the program usually includes some musical feature in order to make it more popular. Moving pictures are not utilized, due mainly to the fact that many of the smaller places visited are without electricity, and the cinematograph picture is unsatisfactory when illuminated by any light other than electricity.

All charts and diagrams are of uniform size, so that they may be conveniently packed in trunks specially made for the purpose. The frame on which the exhibit is hung is so constructed that it may be readily taken apart and packed. The exhibit is carried as excess baggage. The stereopticon, with its oxyhydrogen apparatus, is transported by express.

During the year 1913 no regular exhibit was given, although it was occasionally sent out at the request of a locality and the expenses borne by that locality. The expense of regular exhibits is borne by the State board of health.

Minnesota Public Health Association.—There has recently been formed out of the previously existing State Association for the Prevention and Relief of Tuberculosis an organization known as the Minnesota Public Health Association, which has for its object an educational campaign, including the dissemination of popular information relating to public health and sanitation. The society has secured as its secretary an expert on public health, who is also as-

sistant director of the extension division of the State board of health. Under these circumstances the activities of the society should be productive of great good.

Personally, I can not but think that the efforts of most societies of this kind are misdirected. The actual work in connection with the eradication of disease is a legitimate function of the State, but to accomplish results it must have the cooperation of every citizen. A society composed of public-spirited citizens can best give this necessary cooperation by having for its sole object the determination to secure needed legislation and money for the State health department, thus strengthening a valuable and permanent organization. The officials of the State board of health of Minnesota are continually handicapped in their work by having too few employees, little law, and less money.

School Hygiene and Child Welfare.

School hygiene.—Formerly the State board of health had a number of excellent regulations covering the subject of school hygiene. In 1913, the State educational authorities secured the passage of a bill taking away from the State board of health the authority to make such regulations, except as to standards for toilets, water supply, and the disposal of sewage, and vesting the authority in the superintendent of education. The regulations of the State board of health were, however, used as a basis for formulating others. The only regulations relating to schools which are at present in force therefore are those directed against the spread of the communicable diseases, and have already been mentioned.

Except in a few isolated instances, the State board of health has **recently taken** little action toward establishing any system of school medical inspection. This appears to be due to a deficiency in the size of the field force and funds with which to carry on the work.

There seems to be at present a controversy as to what branch of a State or local government should have charge of school hygiene, the health department or the school department. It is certainly the proper function of a health department to eradicate the preventable diseases. Any disease which can be controlled by a proper supervision of individuals, occupations, or environment is a preventable disease.

It is a duty of the health department to study infant or child welfare, including prenatal care of mothers, and to institute measures to conserve human life and health during the earlier periods of existence.

It is equally true that the duty of preventing both communicable and industrial diseases among the adult population also devolves

upon the health department. If the medical inspection of schools is placed in the hands of school authorities there is lost to the health department a most valuable period, namely, during the school age of the child, in which to carry on valuable studies and follow up the previous work in infant welfare. In addition, the work of the school nurse, not only in but out of school, furnishes much information, which can be of value to the health department only when she works in close cooperation with it.

It is frequently said that the average health department is neither sufficiently well endowed nor organized to properly carry on this work. This, however, is no argument against the plan. On the contrary, it is an excellent reason why such department should be so strengthened as to enable it to do the work and do it well.

In cities the medical inspection should be carried on by the local health department. In rural communities the same work should be done by the State health department.

It is pertinent here to point out the great discrepancy existing between the appropriations for health work and for school work in the State of Minnesota.

The State board of health will receive during the year 1915, \$67,000, a wholly inadequate amount to enable it to carry on the work necessary. On the other hand, the State aid to public schools for 1915 will amount to \$4,300,000, and this figure does not include the expense of maintaining the State university nor the State normal schools. If health is equal only in importance to education, it is a sufficient reason why a more equitable distribution of the State's funds should be made.

Formerly the State board of health had a division of school hygiene, under a director whose duty it was to guide and assist local health or educational authorities in instituting and maintaining an adequate system of school medical inspection. On account of lack of funds the work of this division had to be discontinued and the division abolished. Since then the State board of health has practically done nothing except through one county health officer, who is a full-time man, receiving part of his salary from the State. His duties include the medical supervision of school children in the city of Rochester and the county of Olmsted. This work is also about to be discontinued on account of the resignation of the health officer and the probability is that his place will not be filled, at least for some time.

A method of taking a disease census among school children has been devised by the director of the division of preventable diseases, to be put into operation in such places within the State as have efficient local medical supervision of school children. It has for its object the recording of every communicable disease a child may

have had or that may be contracted by it while attending school. Such knowledge is valuable in determining the immune children during any epidemic or as an aid in differential diagnosis, thus greatly assisting the epidemiologist in his studies and methods pursued in limiting the outbreak.

A special form card is sent to the parent containing spaces for supplying the following information: Name of child, school address, home address, date of birth, place of birth, and dates of residence outside of Minnesota. On the reverse side of the card are spaces to be filled in by the mother, giving the age when the child had the diseases specified on the card, and the age at which it was vaccinated. These cards are filed by the teachers, a notation being made by them as to school and grade, date of record, sex and age of child. If a pupil is absent on account of a communicable disease, the teacher notes such absence on the card, and upon the convening of school she notes also any communicable diseases contracted during vacation. A special form is used to summarize this information, which is then forwarded to the division of preventable diseases. A card index is kept in the division of preventable diseases of the number of pupils in each school, and maps showing the location of schools throughout the State.

Child welfare.—Formerly the State board of health took an active interest in child welfare, and, in connection with school hygiene, commenced a study with the intention of taking the necessary steps to conserve child life. This, with the school work, had to be discontinued for lack of funds. It is a subject of such vast importance that it is to be hoped the coming legislature will appropriate sufficient money to continue this and similar work.

In connection with child welfare, the State board of health is empowered to promulgate regulations providing for the "management of lying-in houses and boarding places for infants and the treatment of infants therein." Local authorities are required to enforce regulations that have been made under this authority. They are summarized as follows:

All lying-in houses and boarding places for infants are required to obtain a license from the local health officer. After the necessary inspection, he issues such license, and is entitled to a fee of \$2 for the same. The license expires on the 1st day of January, and may be renewed upon the payment of a fee of \$2. A copy of the license must be filed with the State board of health within 10 days after its issuance, and must contain a certificate of the health officer to the effect that the applicant is of good moral character. It must also contain a description of the premises, number of children that may be received in the institution, etc. Before a license is issued, the premises and furnishings must be in good sanitary condition.

Local physicians and midwives may be granted a license to operate a lying-in hospital.

All births in such institutions must be reported within three days to the local health officer by the person in charge. The name and age of any child taken into a boarding house for infants, with the place of residence of the person placing the child in the institution, must be reported to the local health officer within three days.

All health officers are authorized to visit and inspect such institutions, and may revoke the license for cause. The officers of any incorporated society for the prevention of cruelty to children are also authorized to inspect such premises. The secretary of the Minnesota State board of health, or other representative of the State board, is also authorized to enter and inspect such premises, and has authority to inspect children as to their physical condition.

It is prohibited for any person to offer, either by advertisement or in any other way, to dispose of the child of another, or to place a child in a boarding house of the type and character described as an inducement for anyone to come to their premises during confinement.

CLERICAL DIVISION.

The clerical division is in charge of the assistant secretary, who, in the absence of the secretary, performs his administrative duties. The assistant secretary is not a physician. Although the law does not require that the secretary shall be a physician, he needs to have the qualifications of a physician in order to properly carry out all of his duties. In the absence of the secretary the logical head would be the director of the division of preventable diseases, but on account of the different divisions of the State board being located in different places this is not entirely practicable. The present assistant secretary would be more properly termed the chief clerk, or assistant to the secretary, and, on account of his thorough familiarity with the details of the administrative work of the State board of health, he is essentially capable of filling such an important position.

The personnel of the division and their respective salaries at present are as follows:

| | |
|-----------------------------|----------|
| assistant secretary----- | \$2, 400 |
| clerk and stenographer----- | 780 |
| stenographer----- | 1, 080 |
| messenger----- | 270 |
| | <hr/> |
| | 4, 530 |

Duties of the division.—The clerical division is concerned with the filing of all correspondence of the executive office, and copies of letters and reports sent out by other divisions of the State board. It is also concerned with keeping accounts of expenditures, the issuance of licenses to embalmers and rendering establishments, the issuance of blank forms, etc., to local authorities, the compiling of statistical information for the division of vital statistics, and numerous other miscellaneous duties. In addition, the assistant secretary is not infrequently called upon to make inspections in different parts of the

State relative to nuisances and prepares material for the health exhibit.

Records and reports.—Two records are kept of expenditures, one of which is required by the State auditor and one by the public examiner. Neither one of these records is of any great utility to the State board of health.

Expendable and nonexpendable property is purchased by the directors of the different divisions on special order forms without specific authority from the secretary unless of an extraordinary nature, when the previous approval of the secretary must be obtained. Vouchers are made out in the division for which the article is purchased. These are "O. K'd" by the director of the division, showing that the materials have been furnished, and then transmitted in duplicate to the assistant secretary.

A monthly abstract accompanied by the original vouchers is transmitted to the State auditor, and a copy of the same abstract is sent to the State treasurer.

The bills are numbered serially for each fund from which they are to be paid, and the duplicates are bound and kept in the files of the State board of health.

All checks for reimbursement are issued by the State treasurer after the bills have been approved by the auditor, and are forwarded to the secretary of the State board of health, from whose office they are transmitted to the proper person.

The account required by the auditor consists of a semimonthly statement to be kept in a ledger showing the total expenses charged against each fund, and a record of receipts either from the sale of licenses or for reimbursement for work done by the State board. In the first case, money received must go into the State treasury; in the second instance, it is available to the State board for its maintenance.

The public examiner requires that the expenses for each month shall be segregated and accounted for in a ledger under certain designated headings for each fund, as follows:

| | |
|--------------------------|--------------------------|
| Salaries. | Post office and express. |
| Railroad fares. | Supplies. |
| Hotel. | Miscellaneous. |
| Livery. | Laboratory supplies. |
| Telephone and telegraph. | Betterments. |

A card index is kept by name of employee or firm name of all expenditures incurred by the State board of health, each card containing the number of the voucher, the date on which the expense was incurred, and the amount.

A record is kept of the blank forms, etc., issued to local authorities.

A very simple filing system for letters and reports is maintained. There are two files, one of which is kept by locality, letters on subjects relating to the public health being filed in the file of the particular locality. Another file is kept by subjects, all matters relating to that subject being placed in the file. A cross index is not kept.

Expenses.

In order that the State board of health may be able to determine at any time the exact cost of any division, subdivision, or piece of work, a system of accounts should be kept similar to that which was recommended for the State department of health of Maryland and in accordance with the statement of expenditures which is appended herewith. This statement was gotten up only after much labor, but is approximately correct. A change in the system of bookkeeping would make it a very easy matter to prepare such a tabulation. A system like that recommended enables the different officials to learn at a moment's notice the financial standing of their divisions and to determine accurately the cost of carrying on their activities. It is also valuable in making a comparison of the cost of work in the different health departments.

The present order blank could be modified so that it should serve both as an order and a requisition, and as soon as articles are ordered a copy should be furnished to the assistant secretary.

In the interests of labor saving it might seem reasonable for the auditor and State examiner to devise a system of bookkeeping satisfactory to both.

The tabulation shows that the expenses for the year ended July 31, 1914 (the fiscal year adopted by the State), amount to \$72,013.31. The total appropriations for that year were \$66,500, which, plus the balance available at the end of the previous year—namely, \$5,054.29—amounted to \$72,554.29. This represents a deficit for the year of \$459.02.

Appropriations.

The appropriations for the State board of health are divided into certain funds, as follows:

| | |
|----------------------------|-----------|
| General..... | \$14, 500 |
| Communicable diseases..... | 15, 000 |
| Vital statistics..... | 5, 000 |
| Sanitary engineering..... | 7, 000 |
| Laboratory..... | 18, 000 |
| Pasteur institute..... | 7, 000 |
| Total..... | 66, 500 |

The total amount appropriated, namely \$66,500, for 1915, represents but 0.0034 per cent of the total revenue of the State, based on the figures for 1912. The amount is not sufficient to carry on the

activities of the health department. Because of a lack of money, the State board of health has been compelled to discontinue some very important work, and is prevented from developing as it should. It is continually hampered in carrying out even the routine work which is required of it and which must be done expeditiously in order to get results. In fact, the amount granted is not commensurate with the importance of the work done. For instance, the dairy and food commission receives \$66,300; there was appropriated for hog cholera serum \$25,000; there has been appropriated \$25,000 for the payment of agricultural agents to be stationed in the different counties; and the State aid to public schools amounts to over \$4,300,000.

It has been pointed out in a former report that a State should appropriate a minimum of 2 per cent of its total revenues to the health department. The total revenues of the State of Minnesota in 1912 were \$19,313,793.96. Two per cent of this amount would be \$386,275.86, and for a State of the size and importance of Minnesota, this amount would not be too much to carry on the necessary health activities. If the members of the State legislature would make a study of their State board of health's activities, such as has been made the subject of this report, they would come to the conclusion that money so appropriated was money well spent.

At its last session the legislature of the State of Maryland doubled the appropriations of the State department of health. In other words, this department was given \$145,000, instead of \$75,000, to defray the expenses of its activities, including the maintenance of a district health organization. Maryland is about one-eighth the size of Minnesota, having an area of 9,941 square miles, as compared with 80,858 square miles in Minnesota; also the population in Minnesota is greater by 872,844 people; and Minnesota is at least equal to Maryland in the importance of its industries. To properly supervise the health work in such a large territory and among such a population, would require at least twice the number of district health officers as were provided for Maryland, or not less than 20.

Statement of expenditures of the State board of health for the fiscal year ending July 31, 1914.

| | Executive office. | Vital statistics. | Division of sanitation. | |
|---|-------------------|-------------------|-------------------------|------------------------------|
| | | | Engineering. | Water and sewage laboratory. |
| Binding birth and death certificates..... | | \$54.72 | | |
| Blue prints..... | | | \$2.70 | |
| Books and subscriptions..... | \$509.86 | | | |
| Boxes and crates..... | | | 7.50 | \$7.00 |
| Cameras and supplies..... | | | 10.12 | |
| Chemicals..... | | | | 39.87 |
| Chemical apparatus..... | | | 7.00 | |
| Cost of prosecutions..... | 40.67 | 127.46 | | |
| Drinking water, cups, etc..... | | 30.00 | | |
| Dues, conferences and associations..... | 25.00 | | | |
| Expense of licensing embalmers..... | | 90.96 | | |
| Express, freight, and drayage..... | 10.87 | 26.85 | 3.50 | 193.64 |
| Filing cabinets and supplies..... | | 20.00 | 10.15 | |

Statement of expenditures of the State board of health for the fiscal year ending July 31, 1914—Continued.

| | Executive office. | Vital statistics. | Division of sanitation. | |
|---|-------------------|-------------------|-------------------------|------------------------------|
| | | | Engineering. | Water and sewage laboratory. |
| Furniture..... | \$104.69 | | | |
| Laboratory supplies..... | | | | \$354.80 |
| Maps, charts, pictures, etc..... | | | | 1.55 |
| Messenger service..... | | \$2.20 | \$2.30 | |
| Multigraph and adding machine supplies..... | | 1.50 | | |
| Office supplies..... | | 321.53 | 41.23 | |
| Plumbing and repairs..... | | | 26.78 | |
| Postage..... | | 523.55 | 50.00 | |
| Printing..... | | 259.68 | 2.10 | 4.75 |
| Punch machine and cards..... | | 182.37 | | |
| Salaries..... | 4,500.00 | 6,508.31 | 6,019.13 | 6,330.84 |
| Scientific instruments and apparatus..... | | | | 36.67 |
| Technical supplies, engineering..... | | | 59.83 | |
| Telephone and telegrams..... | 31.66 | | 84.00 | 27.10 |
| Towel service..... | | 23.66 | | |
| Traveling expenses..... | 799.40 | 3.39 | 626.31 | 1,183.64 |
| Traveling, members of board..... | 180.29 | | | |
| Typewriter and supplies..... | | 11.50 | 2.75 | |
| Total..... | 6,202.44 | 8,187.68 | 6,955.40 | 8,179.86 |

| | Division of preventable diseases. | | | Extension division. | Clerical division. | Total. |
|--|-----------------------------------|-----------------------------|--------------------|---------------------|--------------------|-----------|
| | Epidemiology. | Bacteriological laboratory. | Pasteur Institute. | | | |
| Binding birth and death certificates..... | | | | | | \$54.72 |
| Blue prints..... | | | | | | 2.70 |
| Books and subscriptions..... | | | | | | 509.86 |
| Boxes and crates..... | | | | | | 17.08 |
| Cameras and supplies..... | \$61.79 | | | \$2.53 | | 71.91 |
| Chemicals..... | | \$176.50 | \$19.33 | | | 235.70 |
| Chemical apparatus..... | | | | | | 7.00 |
| Coal, gas, and electricity..... | 6.95 | 34.64 | 39.50 | | | 81.09 |
| Cost of prosecutions..... | 43.81 | | | | | 211.94 |
| Diagnostic apparatus..... | 21.25 | | | | | 21.25 |
| Drinking water, cups, etc..... | | | | | | 30.00 |
| Dues, conferences and associations..... | 3.00 | 71.39 | | | | 99.39 |
| Expense of licensing embalmers..... | | | | | | 90.96 |
| Express, freight, and drayage..... | 9.78 | | 22.91 | 22.43 | \$22.36 | 312.34 |
| Filing cabinets and supplies..... | 64.46 | 83.12 | 3.75 | | 89.05 | 270.53 |
| Furniture..... | 55.16 | 106.00 | 63.25 | | 34.90 | 364.00 |
| Laboratory supplies..... | | 604.26 | 2,052.21 | | | 3,011.27 |
| Lantern and supplies..... | | | | 60.86 | | 60.86 |
| Mailing cases..... | | 218.64 | | | | 218.64 |
| Maps, charts, pictures, etc..... | 58.92 | | | 57.00 | | 117.47 |
| Messenger service..... | | 38.55 | | .90 | 26.98 | 70.93 |
| Multigraph and adding machines supplies..... | 3.30 | | | | | 4.80 |
| Office supplies..... | 287.56 | 148.45 | 8.80 | 7.09 | 155.03 | 969.69 |
| Plumbing and repairs..... | | | | | | 26.78 |
| Postage..... | 251.98 | 353.85 | 100.00 | | 407.89 | 1,687.27 |
| Press clippings..... | 80.00 | | | | | 80.00 |
| Printing..... | 366.75 | 34.40 | | 20.28 | 31.00 | 718.96 |
| Punch machine and cards..... | | | | | | 182.37 |
| Repairs to laboratory buildings..... | 25.68 | | 773.91 | | | 799.59 |
| Rent..... | | 336.00 | | | | 336.00 |
| Salaries..... | 10,512.19 | 10,923.63 | 4,254.32 | 1,675.00 | 4,233.50 | 54,956.92 |
| Scientific instruments and apparatus..... | | 89.19 | 20.06 | | | 145.92 |
| Technical supplies, engineering..... | | | | | | 59.83 |
| Telephone and telegrams..... | 163.38 | 171.51 | 20.00 | | 205.21 | 702.86 |
| Towel service..... | | 50.51 | 14.94 | | | 89.11 |
| Traveling expenses..... | 2,270.80 | 72.90 | 63.55 | 42.04 | | 5,062.03 |
| Traveling, members of board..... | | | | | | 180.29 |
| Typewriter and supplies..... | 29.40 | 76.25 | | | 31.35 | 151.25 |
| Total..... | 14,316.16 | 13,589.79 | 7,456.53 | 1,888.18 | 5,237.27 | 72,013.31 |

| | | |
|------------------------------|-------------|-------------|
| Total expenses..... | | \$72,013.31 |
| Appropriations, 1914..... | \$66,500.00 | |
| Balance, August 1, 1913..... | 5,054.29 | |
| | | 71,554.29 |
| Deficit..... | | 459.02 |

FIELD FORCES, ACTIVE AND POTENTIAL.

The field activities and the officials of the State board of health engaged therein have already been mentioned under the designation of the different divisions in which they are employed. The question of local authorities, however, has not been mentioned and remains to be considered.

Local Authorities.

Requirements of law.—The State laws relating to the organization of local health boards and the duties and powers of local health officers are summarized as follows:

A county board of health is formed of two county commissioners and one physician resident in the locality. It has jurisdiction over unorganized territory only. The township board of health consists of the township board of supervisors. It has jurisdiction over every village in the township where no organized board of health exists. Every village may have and every city must provide by ordinance for the establishment of a board of health. Failing to so provide, the State board of health may appoint three or more persons to act until the local board is established, in which case the State may fix the salary which must be paid by the city. At least one member of every local board must be a physician. His duties are to act as local health officer and executive of the board. If no member of the town board is a physician, it must appoint one as health officer for the town. Compensation is fixed by the local board and must be paid by the county or municipality.

Under the law, the State board of health is given supervision over local boards.

It is the duty of the local boards of health and health officers to make necessary investigations and reports and obey such directions concerning communicable diseases as the State board of health may require or give, and, under the general supervision of the State board of health, must cause the enforcement of all laws and regulations relating to public health. If any health officer refuses to perform any duty required of him, he is deemed guilty of a misdemeanor.

In the performance of their duties, all employees in local health organizations have the right of entry to any building, conveyance, or place. Anyone who obstructs such entry or otherwise interferes is guilty of a misdemeanor.

All local boards of health must employ at the cost of the township, county, or place, as the case may be, all help necessary for the suppression of communicable diseases or the enforcement of the laws and regulations of the State board of health. For failing to do so, the State board may employ such assistance and charge it to the locality.

Local health officers have the right to order the abatement of any nuisance, allowing not more than 10 days for such abatement, and if the order is not obeyed, the locality may have the work done and charge the expense against the offender, provided that the total cost is not more than \$25.

The law also places the collection and disposal of night soil from privy vaults and the contents of cesspools, in places having a population of over 50,000 inhabitants, in the hands of the local authorities.

The method for abating any nuisance by the city and charging the expense against the offender is specified in detail in the law.

The council of every city having 10,000 inhabitants or less may provide for the inspection of milk sold within its limits, and the dairies and dairy herds from which the milk comes.

The council may appoint a competent licensed veterinarian as city dairy inspector, who must make an inspection once a year of dairies and dairy herds. He is entitled to a fee of 25 cents for each animal inspected. This fee is paid by the owner. The inspector is appointed at the first meeting of the city council after the election and holds office until his successor is appointed. When he finds that dairies and herds are in a sanitary and wholesome condition he issues a certificate setting forth the facts. This certificate is good for one year.

Anyone who sells milk without such a certificate is guilty of a misdemeanor.

Local health officers are required to inspect the jails once a year with reference to sanitary conditions, and make the necessary report to the board of control, and are entitled to a fee of \$2, paid by the locality. If the report of the local health officer indicates that the jail is in a condition dangerous to the life or health of the inmates, the board of control has the power to condemn the building.

It is prohibited for anyone to engage in a trade or employment which is dangerous to the health of the community or injurious to neighborly property without a written permit of the board of health of the town, village, or city. For violation there is provided a penalty of \$50 for each day on which the trade is exercised.

Local boards may designate places wherein such trades or employments may be carried on and may revoke any license granted.

Any person carrying on the business after 24 hours after the permit is revoked is liable to a fine of \$100 for each day.

A person has the right to appeal to the district court within five days after the revocation of his permit. Details relating to the process of appeal are given in the law.

Requirements of regulations.—The following regulations have been promulgated by the State board of health for the guidance of county health officers and local health officers. These regulations give the county health officer the duties of an investigator, requiring him to keep in touch with certain sanitary matters within his county, but do not give him any powers of control. In fact, according to the law, his powers of control are effective only in unorganized territory. As a matter of fact, the county health officer is of very little utility to the State.

County health officers are required to make quarterly reports to the Minnesota State board of health, relative to general sanitary conditions and communicable diseases, special attention being given to reporting rabies and glanders.

They must keep a close watch over apparent epidemic or endemic diseases, and if any question arises as to the proper care, must notify the secretary of the State board of health, so that an investigation may be made.

The county health officer is required to report to the State board if he believes that returns of births and deaths are not being made as required by law.

He must note the conditions of slaughterhouses, rendering establishments, etc., and report to the secretary of the State board of health as may be necessary.

He must bring to the attention of the secretary of the State board of health any conditions which may be in need of sanitary regulation.

County health officers are required to assemble at the call of the State board of health once a year to discuss general sanitary problems.

They must obey any directions relating to sanitary problems received from the State board of health.

Upon application of not less than five county health officers, the State board of health must call a special conference to discuss special or local sanitary problems.

The health officer of every city and village is required to make a sanitary inspection of his municipality in the month of May. A written report, with recommendations, must be made to the council, on or before the 1st day of June in the year in which the inspection is made. A copy is submitted by the health officer to the State board of health before the 1st of July. Other inspections may be made as necessary.

Preceding such inspection, an order must be published in the local papers to clean all yards, vaults, and cesspools; also all sheds or barns containing manure, before a given date. If upon such second inspection this general order is not obeyed, individual notices must be served.

A study which was made of local health organizations disclosed the fact that the local health officers are generally rather enthusiastic and more or less energetic in the performance of their duties.

There are a few localities in the State which employ full-time health officers, but the great majority employ, at small salaries, practicing physicians, who are required to give but a small part of their time to the health department. Such a system is bad. The practicing physician can not afford to devote the proper amount of time to public-health work, and if he performs his duties properly he will incur the enmity of people upon whom he is depending for his private practice and therefore his living.

In Minnesota the county health officer plays little part in public-health matters, for the law gives him jurisdiction over unorganized territory only.

In townships the board of supervisors acts as the board of health, and they are required to appoint a health officer, although he may be so appointed to meet an emergency only. A village may, and a city must, appoint a health officer. If the city does not provide for a health officer the State board of health may appoint one and name his salary. The law already provides for the proper supervision of local boards by the State board of health.

There is great need for the State to have more representatives in the field who can be in close touch with local authorities. For this reason 20 district health officers should be appointed and receive their salaries from the State. They should be the State's direct representatives in the field, have supervision of local authorities, and perform all the duties required of any health officer.

There is held annually a conference of local health authorities with the State authorities. Unfortunately the law does not permit the payment of traveling expenses of the local authorities. They must, therefore, come at their own expense. For this reason the conferences are not productive of as much good as they should be.

In general, localities in the State of Minnesota may be divided into those situated in the agricultural districts and those on the Iron Range. The latter derive their revenue, in large part, from the iron mines, and have plenty of means. The former have much less income and apparently less appreciation of public-health needs.

The municipalities on the Iron Range should be put in the front rank as far as public-health activities are concerned. For instance, the village of Chisholm, with a population of about 8,000, treats its water by filtration and with hypochlorite. It is sewered, and is building a modern sewage-disposal plant. It is contemplating the purchase of an incinerator for garbage. It has a modern communicable-disease hospital, to accommodate 20 patients. Its schools are of the most recent type, and there is a well-organized system of medical inspection, with an efficient all-time school medical inspector and a nurse. The system even includes a dental chair in the school. The health officer, however, is only a part-time man, and the organization in the health department could be improved.

The mining companies are greatly interested in the improvement of health conditions, not only in the cities located on the range, but in their own mines and in the settlements of their own employees. They have introduced safety devices throughout all of their operations, and are, no doubt, to a large extent instrumental in causing municipal authorities to improve and maintain sanitary conditions. The alleys of the different municipalities are as clean as the streets, and every house has a covered garbage tin raised on a platform about 4 feet from the ground. There are bubbling fountains located on the streets and in public buildings. One of the towns has an all-time health officer and maintains a bacteriological laboratory.

The city of Duluth has a specially maintained dispensary with visiting nurses for tuberculosis, and it aims to have every patient placed in a hospital. Even the incipient cases are sent to a sanatorium, so that they may receive instruction in what precautions to take to prevent the spread of the disease.

Duluth has been endeavoring to secure a pure milk supply for the last 10 years, and the educational work has succeeded in getting the cooperation of producers within the city limits, so that much of the milk sold to consumers is within the limits of a certified milk. Some of the milk is produced outside of the city. This is not of such a good grade, but is pasteurized before being sold.

The city of Winona, situated in an agricultural district, has secured the services of an energetic veterinarian who, in the last year, has succeeded in getting the cooperation of the producers sending milk to the city, as well as of the distributors. The dairy farms are good examples of what can be done without the expenditure of a great deal of money. Cleanliness is maintained, and simple devices,

such as the use of the small-top milk pail, have been introduced, with a general renovation of the barns, giving better light, ventilation, and drainage, and the testing of herds for tuberculosis. Practically all of this has been accomplished in the last year, and the analysis of the milk shows it to be of an excellent quality.

In New Ulm there is an example of what can be done in the construction of a slaughterhouse for a small municipality. The building is of rat-proof material, is well drained and ventilated, and has an ample water supply, etc.

Other examples of modern public-health methods might be quoted, but in every case it would have to be said for the municipality that its health department lacked organization.

The State of Minnesota is very large and rich, and contains many prosperous communities, and it is thought that there is hardly a single locality that could not afford to appropriate sufficient money to increase the efficiency of its health department.

OFFICERS OF THE STATE BOARD OF HEALTH.

State Board of Health.

Dr. W. A. Jones, president.

Dr. B. J. Merrill, vice president.

Dr. Egil Boeckmann, Dr. Frank Burton, Dr. Winslow C. Chambers, Dr. Christopher Graham, Dr. C. L. Greene, Dr. O. J. Hagen, Dr. C. W. More, members.

EXECUTIVE OFFICE.

Dr. H. M. Bracken, secretary and executive officer.

DIVISION OF PREVENTABLE DISEASES.

Dr. A. J. Chesley, director.

Miss E. M. Wade, assistant director, chief of bacteriological laboratory.

Dr. O. McDaniel, chief of Pasteur Institute.

DIVISION OF SANITATION.

Dr. R. H. Mullin, director.

Mr. H. A. Whittaker, assistant director.

Prof. Frederic Bass, consulting engineer.

DIVISION OF VITAL STATISTICS.

Dr. H. M. Bracken, State registrar of vital statistics.

Mrs. Gerda C. Pierson, assistant State registrar of vital statistics.

EXTENSION DIVISION.

Dr. H. M. Bracken, director.

Dr. H. W. Hill, assistant director.

CLERICAL DIVISION.

Mr. O. C. Pierson, assistant secretary.

HEALTH ACTIVITIES CARRIED ON BY OTHER AGENCIES.

Certain activities relating more or less directly to a department of health are carried on by State boards or commissions entirely distinct from the State board of health.

| Activities. | Board or commission. |
|---|--|
| Licensing of barbers..... | State board of examiners of barbers. |
| Enforcement of pure food law, including milk. | State dairy and food department. |
| Inspection of factories..... | Bureau of labor. |
| Control of insane and insane asylums..... | State board of control. |
| Regulation of practice of dentistry..... | State board of dental examiners. |
| Regulation of practice of pharmacy..... | State board of pharmacy. |
| Control of sanatoria for the tuberculous.... | { County sanatorium commissions. Advisory commission, Minnesota State Sanatorium. |
| Registration of nurses..... | State board of examiners of nurses. |
| Enforcement of drug law..... | State board of pharmacy. |
| Regulation of practice of medicine..... | State board of medical examiners. |

RECOMMENDATIONS.

As a result of a careful study of public health administration in Minnesota, continued over several months, certain definite conclusions have been reached and are made the basis of recommendations as follows:

1. That the designation of the State board of health and its status in the State government be changed to that of a State department of health.
2. That all of the different subdivisions of the State department of health be located in the same building.
3. That an assistant director and two additional bacteriologists be appointed in the division of preventable diseases.
4. That the State be divided into not less than 20 health districts, each district to be composed of one or more counties, at the discretion of the State department of health.
5. That a physician trained in sanitary science be placed in each district, and that he be given an office and an adequate number of assistants, including inspectors, nurses, and a clerk.
6. That he hold office during efficiency and good behavior; that he be given an adequate salary from the State; and that he be prohibited from practicing medicine or engaging in any private business that would interfere with his official duties; that he be allowed traveling expenses when traveling on account of official business; and that he be given, as he proves himself capable, a regular yearly increase in salary until he has reached a maximum which, in the

judgment of the board of health, is sufficient; that he first receive a probationary appointment to determine his qualifications in the field; and that no one be appointed until he has passed an examination before the board or the secretary or has otherwise proved himself capable of filling the position.

7. That he be made responsible to the State department of health for the conditions in his district and that he be given full power to enforce laws and regulations within his jurisdiction and authority over all county, city, or town health officials.

8. That his powers and duties be well defined by law and include the enforcement of the law regarding the notification of cases of disease; inspection of dairies, canneries, and all places of business or manufacture within his jurisdiction; the inspection of county schools and school children; the investigation of cases of sickness and the institution of measures for the control of disease; the investigation of nuisances and abatement of same; the keeping of complete records of transactions and forwarding all necessary reports to the State department of health; the delivery of public lectures throughout his district; the collection of samples for analysis; the enforcement of the laws relating to the registration of births and deaths; and the performance of all other duties that may be required of him by the State department of health.

9. That the field organization be mobile so that a force of health officers or assistants can be concentrated in any part of the State or in any city within the State.

10. That the number of employees in the division of sanitation be increased by at least five men, four of whom shall have received training in sanitary engineering and one of whom shall be an expert in analyses of water and sewage.

11. That the State be divided into four districts in each of which shall be placed one of the men above mentioned as having received training in sanitary engineering, this field force to come under the supervision of the division of sanitation.

12. That comprehensive regulations be promulgated relative to water supplies and the disposal of sewage and refuse throughout the State.

13. That hereafter all plans of public buildings be submitted to the State board of health for approval as to the sanitary arrangements, as already provided by law.

14. That a law be enacted requiring the reporting of all marriages and divorces to the State department of health.

15. That tabulating machines be installed in the division of vital statistics.

16. That the prevention of occupational diseases and the maintenance of sanitation in places employing labor be placed under the control of the State department of health, and that legislation be enacted to give it all necessary power to act.

17. That the work relative to school hygiene and child welfare, previously discontinued by the State on account of lack of funds, be resumed.

18. That provision be made for the distribution of free antitoxin throughout the State where necessary.

19. That a popular bulletin be issued monthly, and especially used for instructing children of the public schools.

20. That the expenses of district health officers attending the annual conference with the State be allowed.

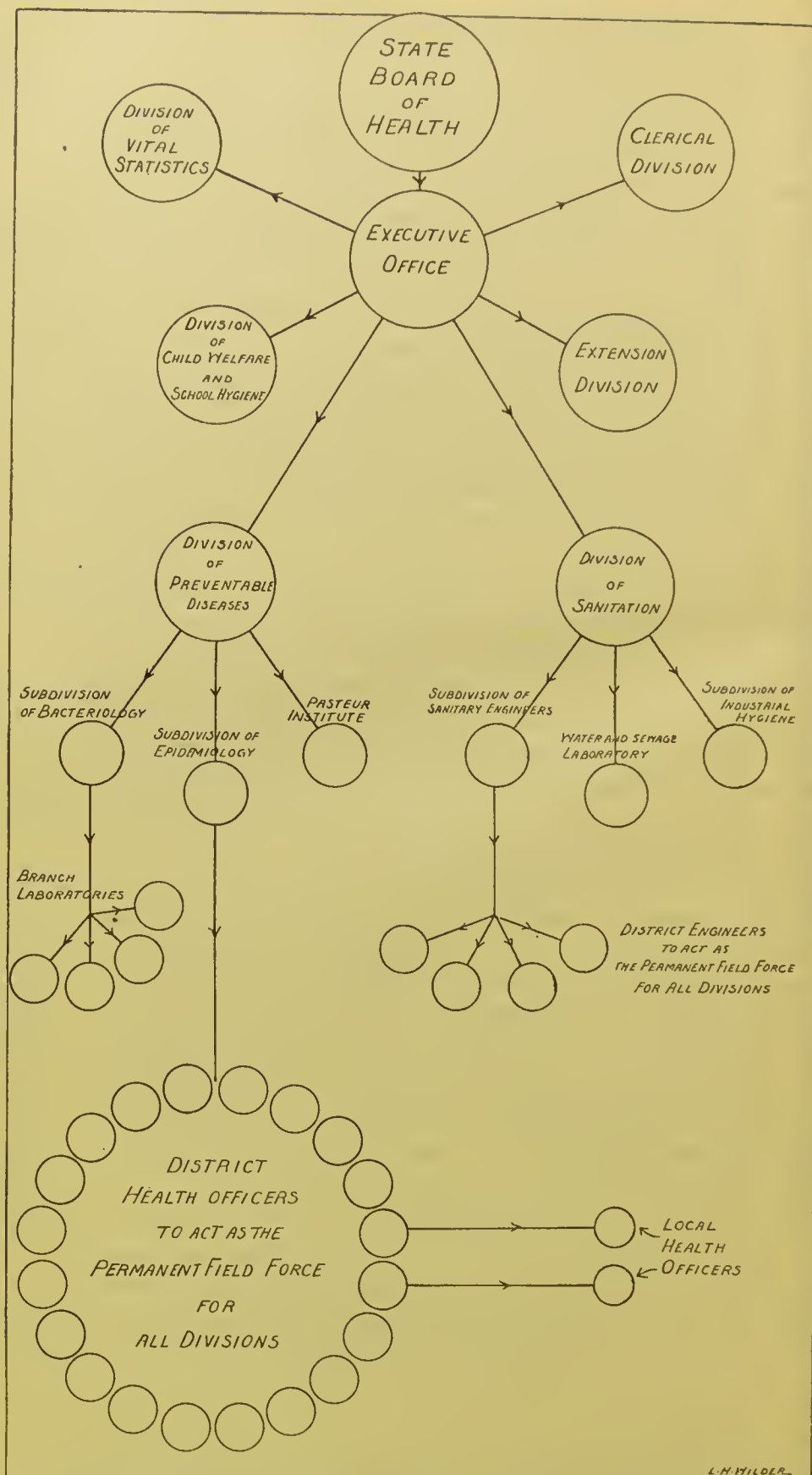
21. That all of the officials of the State department of health be made full-time men.

22. That the method of keeping accounts be so changed that it will enable one to determine quickly and accurately the exact cost of any division or subdivision or piece of work at any time.

23. That to properly care for the work required by the increasing activities of the State department of health more clerks and technical assistants be employed in its different subdivisions.

24. That not less than \$270,000 be appropriated to the State department of health to be allotted by the State board as may be necessary for the following purposes:

| | |
|---|-----------|
| General | \$20, 500 |
| Preventable diseases..... | 25, 000 |
| Special tuberculosis..... | 17, 000 |
| Laboratory (relating to preventable disease)..... | 28, 000 |
| Pasteur Institute..... | 10, 000 |
| Free antitoxin..... | 10, 000 |
| Vital statistics..... | 10, 000 |
| Child welfare and school hygiene..... | 10, 000 |
| Control of water and sewage..... | 30, 000 |
| Industrial hygiene..... | 10, 000 |
| District health organization..... | 100, 000 |
| | <hr/> |
| | 270, 500 |



SCHEME OF ORGANIZATION SUGGESTED FOR THE STATE BOARD OF HEALTH OF MINNESOTA.

PRESENTED BY
PROF. G. H. F. KUTTALL

UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION IN
THE STATE OF WASHINGTON

BY

CARROLL FOX

Surgeon, United States Public Health Service

REPRINT No. 255

FROM THE

PUBLIC HEALTH REPORTS

FEBRUARY 5, 1915



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PUBLIC HEALTH ADMINISTRATION IN WASHINGTON.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of studies of health organization and administration in the State of Washington similar to that previously conducted in Maryland and Minnesota. The studies were begun September 11, 1914, and continued until January 13, 1915. Within this period studies have been made of the operations of the State board of health at its central office in Seattle, and inspection trips have been made to practically all the large centers throughout the State.

Although provision was made for a central health organization in 1881, or earlier, a definite State organization was provided for only in 1891. This last-mentioned provision has subsequently been added to from time to time, notably in 1909, when provision was made for a commissioner of health.

There is evidence of progress in public-health matters since the last-mentioned date, but this progress has not been systematic, and it is found that authority for health activities is scattered among branches of the State government other than the State board of health. It is found also that adequate provision for carrying on public-health work has not kept pace with existing knowledge of these matters or the material growth of the State, nor have sufficient appropriations been made with which to enforce existing provisions of law. All these matters will be subsequently referred to. It is only necessary therefore, to state here that present activities are large in proportion to the facilities provided, and that those charged with the State health administration are desirous of increasing them. It is necessary also to make due acknowledgment for information received from health authorities and others throughout the State.

STATE BOARD OF HEALTH.

The system of administration in the State board of health of Washington is one which closely approaches the ideal. Under the State constitution the board of health has such powers as may be

¹ Reprint from the Public Health Reports, vol. 30, No. 6, Feb. 5, 1915.

delegated to it by the legislature. It may thus issue and assume responsibility for reasonable and necessary regulations when authorized by the legislature. The responsibility of enforcing these regulations, as well as other administrative details, rests directly with the commissioner of health. For obvious reasons it is advisable to have quasi-legislative powers vested in a board rather than in a single executive officer. Outside of these powers, however, the board should be advisory rather than controlling, and this is the case in Washington.

Membership of the board.—The State board of health is composed of six members, five being appointed by the governor, with the advice and consent of the senate, and one, the State commissioner of agriculture, who is *ex officio* a member.

Term of office.—The appointive members hold office for five years, their terms expiring on the 30th day of December of each year consecutively.

Meetings.—The meetings of the board are held in January and June of each year, and at such other times as may be deemed necessary. The January meeting is required by law to be held at the capital. A majority constitutes a quorum. The president is chosen from among the members, the board making and adopting the necessary rules or by-laws for its government.

Salaries and expenses.—The members of the board receive no compensation, but are entitled to reimbursement for necessary traveling expenses.

Powers and duties.—The powers and duties of the State board of health are specified as follows:

To have supervision over all matters relating to the preservation of the life and health of the people of the State.

To have supreme authority in matters of quarantine; i. e., to declare and enforce it; to modify, relax, or abolish it.

To promulgate special or standing orders or regulations for the prevention of the spread of communicable diseases and for other sanitary matters that may best be controlled by general rule.

To make and enforce orders in local matters in emergencies when the local board of health neglects or refuses to act with promptness or efficiency, or in the absence of a local board. Under these circumstances the locality is required to defray the expenses.

To make careful inquiry as to the cause of disease and take prompt action to control and suppress it.

To respond promptly when called upon by the State or local authorities for investigation and report upon water supplies, sewerage systems, disposal of excreta; plumbing, heating, or ventilation of any place or public building.

To make an annual report to the governor of the State.

It is the duty of local officials, including peace officers, to enforce the rules and regulations made by the State board of health, and for failure or refusal to do so they are liable to a fine of not less than \$50 for the first offense and not less than \$100 for the second offense.

Regulations made by the State board of health are particularly strong in this State, as the constitution specifically says that "There shall be established by law a State board of health and a bureau of vital statistics in connection therewith, with such powers as the legislature may direct," thus authorizing the legislature to delegate legislative powers to the State board of health.

As the term of office of the appointive members of the board is five years, one new member being appointed each year, it is impracticable to change the composition of the board so that a majority of its members could favor any particular political policy.

State Commissioner of Health.

The State commissioner of health, who acts as executive officer and secretary of the board, is appointed by the board of health and may or may not be one of its members.

He is required to be a physician of at least five years' experience in the practice of medicine, must be versed in sanitary science, and must have had experience in public-health administration.

His term of office is five years and until his successor is elected and qualified.

He may be removed by the State board of health for incompetency, malfeasance, or corruption, the evidence to be given under oath before the board. For this purpose the board has authority to administer oaths and take testimony.

The salary of the State commissioner of health is \$3,600 a year, and he is entitled to necessary traveling expenses.

Powers and duties.—The duties of the State commissioner of health under the law are as follows:

To be State registrar of vital statistics.

To be the custodian of all property and records of the State board of health and to have charge of the office and all laboratories.

To have the power to enforce all the laws enacted for the protection of the public health and the improvement of sanitary conditions.

To enforce all rules, regulations, or orders of the State board of health.

To investigate epidemics of disease and advise the local authorities as to the best methods for the prevention and control of such diseases.

To supervise such measures as may be taken by the health officers for the control of disease.

To have the same authority in quarantining and disinfecting any person, article, building, or vessel that is now conferred by law upon the local county or city health officer or commissioner. However, he is not authorized to exercise this authority unless the local health officer refuses or neglects to do so.

To authorize the release of any quarantine, whether ordered by himself or by a local health officer.

To investigate and advise when called upon by the county commissioners of any county or the mayor of any city relative to improving sanitary conditions, or disposing of garbage or sewage, or obtaining a pure water supply.

To appoint all employees, including deputy commissioners, scientific, clerical, and other assistants.

The present commissioner of health is a full-time health officer, with the ambition and ability to administer an organization capable of carrying on all the functions required of a department of public health. The carrying out of such activities is a duty which the State owes to its people, but money is necessary to perform them, and any neglect in this respect can not be excused on the plea of economy. In view of the larger aspects of the question, the saving of a few dollars in public health administration is not necessarily a proof of economy. It more likely means that certain important duties have either been entirely neglected or performed only superficially. Every true citizen should be glad to see his government expand so that it will include all duties which are true governmental functions. All he may ask is that the results obtained be commensurate with the money expended. A railroad will expend many thousands of dollars on an installation because it realizes that eventually a profit will accrue therefrom. A government is more apt to base its expenditures within the narrow limits of last year's appropriations. Such views prevent growth and are not consistent with future benefits.

The headquarters of the State board of health are located in the city of Seattle, which is decidedly advantageous, as the State health commissioner, to carry on his work actively, should be situated in the largest business center and in the center of transportation. The quarters are inadequate, however, for even the present small organization. In the future it will be absolutely necessary to secure larger quarters, and it should be kept in mind that for purposes of ease of administration all of the different divisions of the State board of health should be located under the same roof.

Office Hours of the Department.

The office hours of the department are from 8.30 a. m. to 5 p. m., with half an hour for lunch. The lunch hour is so arranged that there is always a clerk present in the office. On Saturdays the hours are from 8.30 a. m. until 12 noon, each clerk in turn remaining Saturday afternoon until 5 p. m. The regular holidays are observed.

In the laboratory the hours are somewhat indefinite, the bacteriologist remaining on duty a sufficient time to finish the day's work. The bacteriologist also visits the laboratory on Sundays and holidays to attend to any routine work that may be necessary. There is no one on duty in the laboratory at night.

Each officer and employee is entitled to and receives an annual vacation of two weeks.

Attorneys for the Board.

There are no attorneys employed by the State board of health. The officials of the attorney general's office are required to perform all of the legal work of the board. In the office of the attorney general are drawn up proposed laws, matters requiring prosecution are attended to, and legal interpretations rendered.

Prosecutions have not been carried on to any great extent, except against violators of the vital statistics act. These have been generally successful.

Officers and Employees of the State Board of Health.

The officers and employees of the State board of health and their salaries at present are as follows:

Dr. Wilson Johnston, president of board.

Dr. Elmer E. Heg, member of board.

Dr. Fred R. Hedges, member of board.

Mrs. R. C. McCredie, member of board.

Dr. H. T. Graves, acting commissioner of agriculture, member of board.

One vacancy.

| | |
|--|----------|
| Dr. Eugene R. Kelley, commissioner of health..... | \$3, 600 |
| Assistant commissioner. (Vacant.) | |
| One assistant deputy commissioner and State health inspector | 1, 800 |
| One assistant State registrar..... | 1, 200 |
| One vital statistics clerk | 660 |
| One vital statistics clerk | 540 |
| One contagious disease clerk | 1, 020 |
| One bacteriologist (part time) | 1, 000 |
| One bacteriologist (part time)..... | 240 |
| | <hr/> |
| | 10, 060 |

EPIDEMIOLOGICAL ACTIVITIES.

The epidemiological activities of the State board of health will be taken up under the following headings: The notification of diseases, the suppression and prevention of disease, and the diagnostic laboratory.

The Notification of Diseases.

Requirements of law.—The laws bearing on the notification of diseases are summarized as follows:

The State board of health may make special or standing orders or regulations for the prevention of the spread of contagious or infectious diseases.

In addition to the above, which applies to the State board of health, the law also specifies that it is the duty of the local board of health, health authorities, or physicians where no health authorities exist, to report promptly the existence of Asiatic cholera, yellow fever, smallpox, scarlet fever, diphtheria, typhus, typhoid fever, bubonic plague, or leprosy, and such other diseases as the State board of health may from time to time specify as contagious or infectious.

It is the duty of all health officers, upon the appearance of any contagious or infectious disease, to make a full report to the State board of health.

It is also the duty of all city health officers, except those in cities of the first class, to report immediately to the State board of health every outbreak of any contagious or infectious disease, and to make a weekly report to the county health officer of all contagious or infectious diseases occurring within their jurisdiction.

The following provisions of law apply to the reporting of diseases by physicians. The subject is mentioned four times—twice in the older laws and twice in a more recent law. In each instance the requirements are different.

Physicians are required to report within 48 hours to the local board of health any case of smallpox, scarlet fever, diphtheria, Asiatic cholera, or other dangerous contagious disease. A penalty is provided for failure to so report.

Physicians in cities of the first class are required to report to the local board of health within five days every case of tuberculosis coming under their observation.

Physicians are required to report to the local health officer, within 24 hours, any case of dangerous contagious or infectious disease or other disease declared notifiable by the State board of health.

Again, in the same law, under the provision making a penalty for violation, it is specified that—

Any physician who refuses or neglects to report to the proper health officer within 12 hours after first attending any case of contagious or infectious disease, or any disease required by the State board of health to be reported, or any suspicious case of such disease, is guilty of a misdemeanor and liable to a fine of not less than \$10 nor more than \$200 for each case not reported.

It is probable that the last provision, namely, 12 hours, is the one on which legal action should be based. For the purposes of notification, however, the 24-hour requirement is satisfactory and is used by regulation of the State board of health.

Requirements of regulations.—Acting under the authority imposed upon it by law, the State board of health has promulgated regulations requiring the notification of diseases, which are summarized as follows:

The diseases declared to be notifiable are:

| | |
|------------------------------------|-------------------------|
| Actinomycosis. | Pellagra. |
| Amebic dysentery. | Plague. |
| Anterior poliomyelitis. | Pulmonary tuberculosis. |
| Anthrax. | Laryngeal tuberculosis. |
| Asiatic cholera. | Rabies. |
| Chicken-pox. | Relapsing fever. |
| Diphtheria. | Rocky Mountain fever. |
| Membranous croup. | Scarlet fever. |
| Echinococcus disease. | Scarlatina. |
| Epidemic cerebrospinal meningitis. | Smallpox. |
| Favus. | Trachoma. |
| German measles. | Trichinosis. |
| Glanders. | Typhoid fever. |
| Japanese lung fluke disease. | Paratyphoid fever. |
| Leprosy. | Typhus fever. |
| Malaria. | Hookworm disease. |
| Measles. | Whoopingcough. |
| Ophthalmia neonatorum. | Yellow fever. |

All cases of, or cases suspicious of the above diseases are required to be reported by physicians to the local health officer within 24 hours. The report must specify the name of the patient, age, sex, residence, occupation, diagnosis, place where probably contracted, date of exposure, and date of onset.

Physicians are also required to report any obscure eruptive disease which may be of a contagious nature.

Teachers and principals of schools are required to report the appearance of a rash in a school child, exclude such child from school, and refer it to the health officer or family physician.

Householders are required to report to the local health officer or family physician the appearance of any acute disease of an eruptive nature occurring in the household.

The State commissioner of health has authority to modify the regulations relative to the reporting of diseases. He may also require that any or all diseases be reported temporarily or permanently, direct to the State board of health, in addition to being reported to the local health officer.

City health officers, except those in cities of the first class, are required to report their contagious diseases to the county health officer weekly.

In addition they are required to report to the county health officer and to the State commissioner of health when any cases of contagious disease not previously present occur in two or more families.

If there are no notifiable diseases present, they are required to report that fact to the county health officer each month.

Local health officers, except those in cities of the first class, are required to keep a record of diseases reported to them, and not later than the 5th of the month following, must submit all original report cards received during the previous month, to the county health officer, together with a summary of the diseases reported to them. These original morbidity reports must contain in addition to the information furnished by physicians, the following data: Date of quarantine and placarding, date of release, number of persons exposed immediately or remotely, place of business or school attended.

Not later than the 10th day of the month following, the county health officer is required to report to the State commissioner of health all contagious and infectious diseases occurring in the previous month, and if no such diseases have occurred, a report must be made stating this fact.

The State commissioner of health may require, if the need arises, that either the original morbidity report or a duplicate, be furnished to the State board of health with the monthly report.

Upon learning of the existence of any case of Asiatic cholera, leprosy, plague, typhus fever or yellow fever, county health officers are required to investigate and immediately report to the State commissioner of health.

Upon learning of the existence of anterior poliomyelitis, chicken-pox in adults, diphtheria, epidemic cerebrospinal meningitis, smallpox, scarlet fever, typhoid or paratyphoid fever, after these diseases have been absent from a community for a period exceeding one month, county health officers, after investigation, are required to report to the State commissioner of health, giving certain epidemiological information, and must at intervals make further reports of the progress of the outbreak.

Methods of procedure.—The same form of card is used in reporting all diseases. These original morbidity reports for the month are forwarded by local health officers, on or before the 5th of the following month, to the county health officers, and are then filed.

The monthly reports made by the county health officers to the State commissioner of health are written on a special form devised for the purpose by the State board of health.

There is no special form used for local health officers to make their weekly reports to the county health officer.

Upon the receipt of the monthly report of the county health officer, the information contained thereon is tabulated by counties, to show the number of cases of notifiable diseases reported during the month. To this is added the number of deaths, which information is obtained from those in charge of the registration of births and deaths. This tabulation is then transferred to a large blackboard, which is exhibited in the office of the State board of health.

The reports from county health officers are always received, although there may be some delay in their transmission. They are, however, not always complete, because some of the local health officers not infrequently fail to transmit their original morbidity reports, as required by the regulations.

Reports of outbreaks of disease within a county, especially smallpox, typhoid fever, scarlet fever, and diphtheria, are sent in with more or less completeness and promptness. Where necessary, such outbreaks are investigated either by the State commissioner of health or his deputy.

Reciprocal notification with other States is practiced in cases where persons suffering from notifiable diseases enter or leave the State.

Reports are sent in monthly to the Surgeon General of the United States Public Health Service, giving information of the reported prevalence of the diseases designated by the conference of State and Territorial health officers with the Public Health Service.

Completeness of reports.—During the period of 12 months ended September 1, 1914, there were reported to the State board of health 854 cases of scarlet fever, with 25 deaths. This gives a case mortality rate of 2.9 per hundred. Assuming that the normal case mortality rate is 3 per cent, it would seem that approximately all cases of scarlet fever occurring within the State are being reported.

During the same period there were reported 4,729 cases of measles, with 56 deaths—a case mortality rate of 1.2 per cent. In a previous report it was assumed that the normal case mortality rate for measles was 1 per cent. Basing the calculation on this figure, it would appear that approximately all cases of measles are being reported. This is not the case, however, for numerous instances have been noted where measles has been prevalent in a community within the State and not a single case reported. Therefore, it is very probable that the case fatality rate of measles is not greater than one-half of 1 per cent, and, using this figure as the basis of calculation, would show that there should have been reported during this 12 months' period approximately 11,200 cases of measles.

There were 880 cases of typhoid fever reported, with 167 deaths, or a case mortality rate of 19 per 100 cases. It is obvious that this

case fatality rate is entirely too high and should be about 4 per cent, or not more than 5 per cent. Using 4 per cent as the proper figure, 4,175 cases of typhoid fever should have been reported, or, using the latter figure, 5 per cent, there should have been reported 3,340 cases. There are, unquestionably, many cases of typhoid fever occurring within the State that either are not reported or are unrecognized by physicians.

Again, there were 422 cases of diphtheria reported, with 56 deaths, or a case mortality rate of 13.2 per 100 cases. This fatality rate is high and may be accounted for in two ways: First, either that all the cases are not reported; second, that the mortality is actually greater than it should be, on account of the failure to use antitoxin. In order that the poor may be able to use this valuable remedy, the State should appropriate sufficient money to furnish antitoxin free to worthy cases in the interest of public health.

There were reported during the same period 1,425 cases of tuberculosis, with 894 deaths. Obviously, many cases of tuberculosis are unreported.

There were 1,163 cases of smallpox reported, with 3 deaths, giving a case mortality rate of 1 death in 388 cases. It is possible that some cases of chicken-pox may have been reported as smallpox, as the regulations require that chicken-pox in adults be treated in the same manner as smallpox. It is probable, however, that a great many more cases of smallpox are classed as chicken-pox than chicken-pox as smallpox.

Suppression and Prevention of Disease.

There is no organized force under the State board of health having charge of the control of communicable diseases. Most of the work thus devolves upon the local authorities. Where it is necessary to take special action the commissioner of health (a physician expert in public-health procedures), or his deputy (an experienced sanitarian) visits the locality, carries on the necessary investigation, and gives the necessary advice.

On account of the very inadequate appropriation to defray expenses and to employ trained assistants, much of this very necessary field work can not be undertaken except in emergencies. Nevertheless, there have been carried on and published some very interesting epidemiological studies on typhoid fever, infantile paralysis, and tuberculosis.

Requirements of law.—The following is a summary of the provisions of law relating to the control of communicable diseases:

The State board of health is given supervision over all matters relating to the preservation of the life and health of the people of the State.

It is given supreme authority in matters of quarantine.

It is given authority to promulgate regulations for the prevention of the spread of contagious or infectious diseases, and for the control of all sanitary matters that may best be controlled by universal rule.

By the term "dangerous, contagious, or infectious disease" is meant any disease that the State board of health may designate as such.

It is also given the power to make and enforce orders in local matters in emergencies when the local board of health has neglected or refused to do its duty, or when no local board exists. Expenses incurred under such circumstances must be borne by the community.

It is the duty of local boards, health officers, constables, police officers, etc., to enforce the regulations of the State board of health, and upon refusing to do so they are liable to a fine of not less than \$50 for the first offense and not less than \$100 for the second offense.

When disease threatens to become epidemic and the local boards of health refuse to take proper action, the State board of health may, on the authority of its president, appoint a medical or sanitary health officer and the necessary assistants to carry out the regulations of the board, all the expense to be paid out of the county funds.

When any dispute arises relative to the correct diagnosis of any communicable disease, the opinion of the local health officer prevails until the State commissioner of health or the person appointed by him can see the case. His decision must be final.

All health officers are required to make immediate investigation of any communicable disease occurring within their jurisdiction and to take necessary measures to suppress it, in accordance with the regulations of the State board of health.

Health officers are given the power to remove and restrain in a pesthouse or isolation hospital, or to quarantine or isolate, any person ill of a communicable disease. However, no person can be so restrained until examined by the health officer. The health officer is then given power to quarantine, isolate, restrain, or disinfect any person or persons either sick of or exposed to a communicable disease, as well as to disinfect any room, house, or contents, clothing, bedding, etc., that may be infected.

The method of procedure to be instituted by the State board of health for the violation of any of its orders or regulations is provided for by law.

Any fines collected are paid into the State treasury.

Penalties are also provided where any member of a city or county board of health refuses to enforce the provisions of the law or regulations of the State board of health. Under such circumstances he is liable to a fine of not less than \$10 nor more than \$200.

Any person who refuses to obey the provisions of the law or regulations of the State board of health, or who breaks quarantine, or conceals a case of communicable disease, is liable to a fine of not less than \$25 nor more than \$100, or to imprisonment in the county jail not to exceed 90 days, or both.

Tuberculosis.—In 1899 the legislature passed a law aimed to prevent the spread of tuberculosis. This law applies only to cities of the first class. When enacted it was certainly ahead of the times, but at present it is somewhat out of date. A summary of this law is as follows:

Physicians are required to report in writing cases of tuberculosis within five days after such cases have come under their observation.

Local boards of health are required to keep a record of these reports. Such records are not open to public inspection and must not be published, but other local and State boards of health may make use of them.

The local board of health, unless requested by the attending physician to the contrary, is authorized to furnish the patient or head of the family with printed instruc-

tions for the prevention of the spread of the disease, and to see that the premises occupied by the patient are kept in good sanitary condition and disinfected thoroughly within five days after the death or removal of the patient. The expense incurred is a charge against the owner of the premises.

If the owner refuses to disinfect, the local board may do so at the expense of the city, the cost thereof being a lien against the premises. It is also the duty of the local board to see that tuberculosis is being reported according to law.

For any failure on the part of a physician to report a case of tuberculosis a penalty is provided of a fine not exceeding \$5 for the first offense and not exceeding \$100 for any subsequent offense.

It is made the duty of anyone having tuberculosis or anyone attending a case of tuberculosis, or of the authorities of private or public institutions, hospitals, or dispensaries, to observe any sanitary rules and regulations prescribed by the State and local boards of health.

During the 1913 session of the legislature there was enacted a law authorizing counties to care for patients suffering from tuberculosis and providing State aid therefor.

This law is a good one, although it is deficient in that it does not authorize State or local authorities to compel those suffering from tuberculosis to go to a sanatorium when they are unable or refuse to take the necessary precautions at home.

It authorizes the board of county commissioners to establish and maintain hospitals and employ visiting nurses for the care and treatment of patients suffering from tuberculosis. The county commissioners may appoint a board of managers for such an institution or may themselves serve as the board.

It separates such institutions from almshouses, a very excellent provision, and also requires that all plans for their erection or alteration must first be approved by the State board of health.

The law also specifies that advanced cases shall always be provided for first.

Patients may reimburse the hospital for their maintenance, but no discrimination may be shown because of the fact that such reimbursement is made.

Any person is eligible for treatment who has resided one year within the county. If there are vacancies and no applicants, patients from other counties may be accepted, in which case either they or the locality from which they come must reimburse the institution, in an amount to be designated by the board of managers.

All tuberculosis sanatoria established under the act are subject to inspection by representatives of the State board of health, the State board of control, the State board of supervision and control of public offices, and the board of county commissioners.

It is provided that there shall be paid quarterly by the State to the counties maintaining tuberculosis hospitals \$3 per week for each patient in these institutions except those paying full maintenance.

Similar hospitals operated by cities of the first class may also receive this State aid. These institutions, however, are not required to operate under county control.

The law goes into details as to the general management of the institutions, the methods of securing land, etc.

In order to successfully cope with any communicable disease it is necessary to remove the centers of infection, which in the case of human beings is done by adequately isolating the patient. The disease is bound to spread as long as the patient discharging the causative microorganisms remains in contact with healthy or sus-

ceptible people. This applies to tuberculosis as well as to the more acute communicable diseases. To prevent this is or should be the purpose of the county sanatorium. Such an institution is essentially a public-health institution; that is, its primary purpose is to protect the community, and, secondarily, to care for the individual.

It is to be hoped that every county will see the wisdom of erecting and maintaining a county tuberculosis sanatorium, or, in the case of smaller counties, joining with other counties in the maintenance of such an institution, and that there may be passed a law which will give the power to county commissioners upon the recommendations of health officers, to compel patients to go to such institutions when it is deemed advisable.

The city of Seattle has practically completed a tuberculosis sanatorium which is a credit to the city. This institution will also receive patients from King County, and will receive State aid under the law. There are completed an administration building, containing officers' quarters, kitchens, and dining rooms of such size that they will serve adequately for possible future requirements; one pavilion, two stories in height, which will accommodate 100 patients; and a power plant which will allow for future expansion.

So far the cost of the institution, not including the site, has been \$225,000; making the cost per bed \$2,225. When the other contemplated pavilions are built the initial cost per bed will be materially reduced.

There is almost completed in Pierce County a sanatorium which will accommodate 50 patients, and which will cost approximately \$500 per bed, without equipment, and not including site. This institution is all under one roof.

The plans for a sanatorium for Spokane County have been prepared and \$50,000 appropriated. Allowance is made for future development. The first cost will be about \$1,200 per bed; when all the pavilions are completed this cost will be reduced to about \$500 a bed. This figure does not include site or equipment. Judging from the plans, the Spokane sanatorium when completed should be a credit to the county. It is interesting to note that four other counties have entered into an agreement with Spokane County to use the institution jointly.

Snohomish and Skagit Counties are also contemplating the erection of a sanatorium.

Requirements of regulations.—For the purpose of control, reportable diseases have been placed in three groups.

In the first group are:

Diphtheria.
Scarlet fever.
Asiatic cholera.

Plague.
Typhus fever.
Yellow fever.

These diseases must be quarantined immediately by the health officer and special precautions taken.

By quarantine is meant that the patient, attendants, and all persons who come in contact with patient and attendants are required to remain in the house for a specified period, and that none except the attending physician may enter or leave the house.

Houses under quarantine must be placarded, the placard to contain the name of the disease and the fact that the house is quarantined.

The same rules apply to the sick as to the well in houses which are quarantined.

The health officer is the only one having authority to establish or release quarantine.

In the second group of cases are placed—

| | |
|------------------------------------|------------------------|
| Anterior poliomyelitis, | Ophthalmia neonatorum, |
| Anthrax, | Relapsing fever, |
| Chicken-pox, | Rocky Mountain fever, |
| Epidemic cerebrospinal meningitis, | Smallpox, |
| Glanders, | Typhoid fever, |
| Malaria, | Paratyphoid fever, |
| Measles, | Whooping cough, |

and all cases of so-called Cuban, Dhubie, Egyptian, Japanese, Kangaroo, Manila, or Philippine itch.

Patients suffering from these diseases must be isolated. By isolation is meant that the patient is removed from contact with other inmates of the house and that the house is placarded, the placard to contain the name of the disease and the warning as to its contagious nature. The placard may be removed by the health officer only. Well persons may leave a house under these conditions provided their business does not bring them into contact with children and provided they do not visit places of public gathering.

Patients may be discharged from quarantine after recovery. Contacts may be discharged at the termination of the period of incubation of the disease after they have been personally seen by the health officer and have taken an antiseptic bath and put on clean clothes.

Before quarantine or isolation may be discontinued the room, house, furniture, bedding, etc., must be fumigated.

Attending physicians are required to take all necessary precautions to prevent the spread of the disease.

It is prohibited for any county or city to quarantine against another county or city without the consent of the State board of health.

In the third group of cases have been placed:

| | |
|------------------------------|---|
| Actinomycosis. | Leprosy. |
| Amebic dysentery. | Pellagra. |
| Echinococcus disease. | Rabies. |
| Favus. | Trachoma. |
| Uncinariasis. | Trichinosis. |
| Japanese lung fluke disease. | Tuberculosis (pulmonary and laryngeal). |

The State commissioner of health has the authority to transfer any disease from one class to another, which transfer remains in effect until passed upon by the State board of health at its next meeting.

Health officers are authorized to temporarily quarantine or isolate any suspicious cases pending a conclusive diagnosis.

Domestic animals must be excluded from the house in the case of quarantinable disease, and from the sick room in cases of disease requiring isolation; upon the termination of the disease they must be given a disinfectant bath.

In case of death the health officer is required to continue quarantine or isolation measures until the end of the period of incubation in contacts.

In the case of smallpox, where there are no unvaccinated contacts this further quarantine is unnecessary.

In cases of the exanthematous diseases of childhood, in diphtheria, infantile paralysis, or cerebrospinal meningitis, where there are no other nonimmune children surviving, quarantine may terminate immediately after disinfection.

Adults may be released from quarantine after disinfection, but may not again enter the premises until quarantine is discontinued.

After death from a quarantinable disease no one except a licensed embalmer or a clergyman is permitted to enter the premises until after disinfection.

No milk or food products may be taken into a house under quarantine or isolation unless the container or wrappings can be destroyed. All containers for milk which have been used or handled by persons suffering from a communicable disease requiring quarantine or isolation must be sterilized before they may be again used.

The sale of milk or other dairy or food products from premises where diseased persons are undergoing quarantine or isolation is forbidden, unless the articles are prepared and handled by persons entirely separated from the sick, and then only upon written permission of the local health officer.

No person suffering from open pulmonary tuberculosis nor any chronic typhoid or diphtheria carrier is allowed to do any work involving the handling of dairy, market, or food products in an unwrapped state.

The use of the common drinking cup is forbidden on common carriers, in public buildings, parks, hospitals, schools, hotel lobbies, etc.

In addition to the above regulations, special regulations have been promulgated applying specifically to certain diseases.

Cholera, plague, and typhus fever.—These diseases must be reported by wire to the State commissioner of health and must be strictly quarantined with day and night guard.

Scarlet fever.—This disease must be quarantined until desquamation has ceased and all inflammation of the throat, nose, and ears has disappeared.

No case of scarlet fever may be released from quarantine until six weeks have elapsed from the first appearance of symptoms.

All children who have not previously had the disease must be quarantined for 10 days after last exposure.

All bedding, clothing, dishes, etc., used in the sick room must be disinfected. Formalin or boiling water may be used for this purpose.

Before quarantine is raised the quarantined premises must be disinfected.

Before discharge from quarantine, patients must be bathed in a solution of bichloride of mercury 1-2,000, or its equivalent.

Teachers living in the same house must not return to school until 10 days have elapsed from date of last exposure.

Diphtheria.—In the case of diphtheria, quarantine may be raised when two successive negative cultures are obtained from the throat and nose. The last culture must be taken by a representative of the health office. At the same time a negative culture must be obtained from other individuals under quarantine. In the absence of cultures, quarantine must be maintained for six weeks from the beginning of the disease, and longer if sore throat, false membrane, or discharge from eyes, ears, and nose persists.

Nonimmunes exposed to diphtheria must be quarantined for 10 days after last exposure. However, such contacts may be released from quarantine upon the finding of a negative culture from the throat and nose.

Bedding, clothing, dishes, etc., used in the sick room must be disinfected. Formalin or boiling water may be used.

Patients must receive a bath in a solution of bichloride of mercury 1-2,000 before discharge from quarantine.

Teachers living in the same house with a case of diphtheria are not permitted to return to school until 10 days have elapsed from the date of last exposure.

Smallpox.—Health officers are required to investigate smallpox infection or exposure when cases are not attended by a qualified physician. Physicians must not only report cases, but contacts as well, to the health officer.

Patients must be isolated, preferably in an isolation hospital, until desquamation has ceased.

The house must be placarded with the statement that smallpox exists on the premises.

Contacts must either be vaccinated or isolated for 18 days, unless protected by a previous attack of smallpox or by successful vaccination within 7 years.

Upon the appearance of smallpox, all health officers are required to warn the public of its presence and to instruct the community in the methods for its prevention. Such instructions are furnished by the State commissioner of health.

When smallpox actually exists, it is the duty of the health officers to vaccinate free of charge any person who may make application to them. This expense must be borne by the city or county.

Where smallpox exists in a community, no child is permitted to attend school unless showing evidence of having had smallpox or of having been successfully vaccinated within seven years.

The quarantined premises and contents must be disinfected before quarantine may be raised.

The regulations provide that any municipality may enforce strict quarantine on its own responsibility if it so desires.

Cuban itch, Japanese itch, etc., which are regarded as being mild forms of smallpox, must be treated as such.

Measles.—Cases of measles must be isolated. Nonimmune children coming in contact with measles are prohibited from attending any school until two weeks have elapsed after the beginning of the last case in the family.

Municipalities are authorized to enforce a stricter form of quarantine if they deem it advisable or necessary.

Health officers are required to notify the public upon the appearance of an epidemic of measles and to warn the community not to deliberately expose their children to infection.

Health officers are also required to inform teachers that measles is especially communicable in its early stages, and that they must, therefore, exclude all children showing catarrhal symptoms of the nose, throat, or ears, and to report the names and addresses of such children to the health officer.

The question of closure of schools during an epidemic of measles is left to the local health officer.

German measles.—German measles must be handled in the same manner as measles, except that isolation may terminate in one week from the beginning of the disease.

Chicken-pox.—Cases of chicken-pox must be excluded from school and isolated. Contacts are not required to be excluded from school.

Chicken-pox occurring among adults must be reported and treated as smallpox.

Whooping cough.—Cases of whooping cough must be isolated. Such isolation must continue not less than five weeks from the beginning of the disease, or longer if the "whoop" persists.

Contacts who have had the disease are allowed to attend school.

Authority is given to health officers to withhold this privilege if deemed advisable, as, for instance, when dealing with the first case in the community, or where the history of immunity is obscure.

Rocky Mountain tick fever.—All cases or suspected cases of Rocky Mountain tick fever must be isolated and reported to the State commissioner of health, who will determine what measures may be necessary in such cases.

Anterior poliomyelitis.—Cases of this disease must be isolated for at least 21 days from the beginning of the illness.

Individual reports of these cases must be made to the commissioner of health.

Contacts are prohibited from attending school until isolation measures have terminated and the premises have been disinfected.

All discharges from the throat and nose must be immediately disinfected.

Epidemic cerebrospinal meningitis.—Isolation measures must be continued until the termination of acute symptoms, but no period of isolation must be less than 14 days from the onset, whether terminating by recovery or death.

Contacts in the house can not attend school until 10 days have elapsed after all restrictions have been removed and premises disinfected.

Individual reports of cases must be made by the physician to the State commissioner of health.

Doubtful cases of this disease must be temporarily isolated until it is determined that they are not of the epidemic type.

Ophthalmia neonatorum.—Physicians and midwives are urged to use as a prophylactic a 1 per cent solution of silver nitrate in the eyes of all newborn infants.

Midwives, nurses, and others in care of the new born are required to report to the health officer or to a qualified physician when any pus or secretion forms in the eyes or eyelids, or if one or both eyes should become red and swollen within two weeks after birth.

Typhoid and paratyphoid fever.—All cases of these diseases must be isolated. All but those in immediate contact with the case may come and go without restriction.

The house must be placarded, and printed directions left relative to disinfection.

Excreta from the patient must be disinfected with quicklime or by boiling.

Dishes, bedding, etc. in use must be disinfected with a solution of formalin or by boiling.

The source of infection must be sought for and necessary measures taken to prevent the spread of the disease.

In doubtful cases a specimen of blood should be submitted for examination. Wright's capsules and necessary directions are furnished by the State board of health. It is suggested that where the first examination is negative a second sample be submitted. Where a person is suspected of being a carrier, the fact must be reported, and the necessary instructions will be furnished by the State board of health.

Where a case is suspected of being paratyphoid fever, the fact must be stated in transmitting specimens of blood.

Upon request, antityphoid vaccine is furnished free of charge by the State board of health.

Where a case has developed in a lodging house, hotel, or camp, the person who cares for the patient is prohibited from working at anything having to do with the preparation of foods. As far as possible, this prohibition also applies to private families.

During the summer months rooms in which typhoid patients are treated must be screened, either at the expense of the family or at public expense.

All cases of "typho-malaria" or malaria, unconfirmed by microscopical examination, must be treated as typhoid fever.

Malaria.—Cases of this disease must be isolated as long as the disease remains in the acute form.

As malaria is a rare disease in this State, health officers are directed to send specimens of blood, both for Widal reaction and in smears, to the laboratory of the State board of health for examination.

Anthrax and glanders.—Health officers are required to report to the State commissioner of health individual cases of anthrax and glanders in human beings.

All cases of these diseases must be isolated until the termination of the disease.

Tuberculosis.—Upon request, the State commissioner of health is required to furnish health officers with circulars of information relating to tuberculosis.

Upon the death or removal of any patient suffering from tuberculosis, the premises must be disinfected. No premises may be rented until disinfection has been performed.

In addition to these regulations others have been promulgated relating especially to tuberculosis among school children or those employed in schools, and will be mentioned later.

Leprosy.—Upon the report of a case, the State commissioner of health is required to decide upon its disposition.

Patients who are discharging the bacilli of leprosy from ulcerated surfaces must be segregated and quarantined.

Local authorities are prohibited from imposing quarantine in case of leprosy unless permission is obtained from the State commissioner of health.

Favus.—If upon examination a reported case proves to be favus, a child is prohibited from attending any school until cured, and such other measures must be taken to prevent the transmission of the disease as are required by the State commissioner of health.

Trachoma.—No child suffering from trachoma is permitted to attend any school, except when a competent physician certifies in writing that the case is not in a communicable stage.

Uncinariasis.—Examinations for hookworm will be made by the laboratory of the State board of health.

Persons suffering from uncinariasis must be given proper treatment and isolated until the stools are free from eggs.

Physicians and others are urged to cooperate with the State board of health in securing information as to the existence of the disease in the State.

Rabies.—All cases or suspected cases of rabies in persons must be reported by wire to the State commissioner of health.

Animals suspected of having rabies should not be killed, but should be confined and the circumstances reported to the State veterinarian.

Actinomycosis.—Suspicious cases of this disease should be reported early and a specimen sent to the State laboratory for verification.

Isolation of the case is not required.

Pellagra, amebic dysentery, trichinosis, echinococcus infection, and Japanese lung fluke.—Physicians are urged to report in detail the occurrence of any of these diseases within the State.

Disinfection.—Disinfection or fumigation is carried out according to the recommendations for the different diseases.

It is required for all cases of quarantinable disease before the patient or the contacts are released from quarantine.

The disinfectants recognized under these regulations are those already mentioned and formaldehyde gas, using of the latter at least 16 ounces of a 40 per cent solution of formalin in a generator, or by oxidation, for each 1,000 cubic feet of room space. All openings must be closed and cracks sealed with strips of paper. The time of exposure must be at least six hours.

Where a schoolroom has been occupied by a person suffering from any of the quarantinable diseases—smallpox, anterior poliomyelitis, epidemic cerebrospinal meningitis, or measles—it must be thoroughly disinfected before being used again. The same applies to private schools and to parochial and Sunday schools.

Where a communicable disease has occurred on a vessel or in a railroad coach, such common carrier may not be used again until disinfected by the health officer.

Where a communicable disease has been present in a place where food is sold or which is used for dairy purposes, and the sale of food or dairy products has been discontinued, the premises must be thoroughly disinfected before being used again.

Methods of procedure.—The epidemiological work for the State board of health is performed by the commissioner of health and his deputy. Where only two persons are attempting to perform the functions that should devolve on an organization necessary in a State like Washington, with its large area and population and its varied public-health problems, it is evident that the entire field can not be covered. In fact, constant application to duty with a very limited traveling fund will only permit these officers to respond to the most urgent calls. Where disease is reported and it appears for any reason that energetic steps are not being taken to eradicate it, field investigation is made and advice given. This investigation is sometimes made on the initiative of the commissioner of health and sometimes at the request of the local authorities.

In connection with the field investigation of typhoid fever there is a special form in use, giving the necessary epidemiological data. This form is filled in by the investigating officer.

No follow-up system is in use except a requirement that supplemental reports containing information of value from an epidemiological standpoint be transmitted by the physician for each case of typhoid fever. These are submitted with more or less regularity.

Diagnostic Laboratory.

In the bacteriological laboratory there are employed two part-time bacteriologists.

The laboratory is small, though fairly well equipped for most of the ordinary routine work. In it are made Widal tests for typhoid fever, sputum examinations, examinations of diphtheria cultures, bacteriological examinations of water and occasionally milk, examinations for rabies, and occasionally the examination of slides for pyogenic or other organisms. All of the media used, with the exception of blood serum, are made in the laboratory. This latter, however, is furnished from the laboratory of the health department of Seattle.

The diphtheria outfit consists of a tube of Loeffler's blood serum, closed with a cork stopper and paraffined. This is inclosed in an approved mailing outfit, with a blank for the physician to fill in with the necessary data.

For submitting specimens of blood for the Widal reaction, Wright's tubes, or capsules, are issued to physicians by the laboratory and are accompanied by directions for their use and a blank card for data. The capsules are frequently returned improperly filled, making the examination unsatisfactory, and the bacteriologist believes that as good or even better results would be secured from a drop of blood dried on a glass slide or aluminum foil.

Sputum containers consist of wide-mouth bottles packed in suitable mailing outfits. No data report blank accompanies the sputum outfit.

The Pasteur treatment is administered by the bacteriologist, the virus being secured from the Hygienic Laboratory in Washington.

Antityphoid vaccine is manufactured and distributed free of charge.

The container for the shipment of water samples is the 3-H outfit, manufactured at Lawrence, Kans.

Samples for chemical analysis are sent in demijohns to the chemical laboratory of the State university. When one of these containers is sent out it is accompanied by printed directions for the collection of water samples and a blank data card which is to be filled in by the person submitting the sample.

All samples for diagnosis arriving in the laboratory of the State board of health are entered in a book by a clerk and then turned over to the bacteriologist. When the examination has been made the results in the case of diphtheria and typhoid are noted by the bacteriologist on the data card received with the sample and then turned over to the clerk, who reports the results to the physician by letter or, upon request, by telegraph.

In the case of tuberculosis, no data card being required with the sample, the results are noted on a filing card and are reported by letter.

Data cards and filing cards are filed away for future reference.

In the case of water analyses, a filing card is made out by the bacteriologist containing the results of his findings, which are then copied on special report forms by the clerk and sent to the person requesting the analysis.

Copies of the results of chemical analyses of water are sent by the university to the State board of health to be filed, and copies of bacteriological examinations are sent by the diagnostic laboratory to the university.

The diagnostic laboratory of the State Board of Health of Washington does not perform Wasserman reactions.

It would seem, however, to be an important function of a State health department to determine the presence of syphilis among those who become or who are liable to become public charges and in per-

sons having criminal instincts, especially those found in State penitentiaries and State asylums of all kinds. Certainly, in some instances, the determination of lues and prompt treatment would do away with the necessity of certain individuals finally ending in State institutions, and it is not impossible that by treating those with criminal instincts a marked improvement might be made in their morality. This subject is at least worthy of an extensive investigation, and there is no organization in better position to do this than is a State health department.

Branch laboratories.—In connection with the health departments of the cities of Seattle, Spokane, Tacoma, and North Yakima diagnostic laboratories are maintained. The expenses of the latter are borne one-half by the city and one-half by the county. These laboratories receive no financial aid from the State, but are, nevertheless, of great value to the State board of health, in that they perform much work that would otherwise have to be done by the State laboratory or not be done at all.

Discussion.

In order to properly control communicable diseases, the State board of health is in urgent need of sufficient funds to organize a bureau of communicable diseases, which will have as its duties the collection and disposition of morbidity reports, the maintenance of a larger diagnostic laboratory, and the performance of the necessary field activities.

To properly perform these functions would require additional clerks, a full-time bacteriologist with assistants in the laboratory, and adequate field force, including a sufficient number of epidemiologists at headquarters, and an efficient district or county health organization.

In addition, methods would have to be instituted which would enable the bureau of communicable diseases to keep close track of all diseases occurring in the State. This would mean a more complete system of reporting, a follow-up system, county spot maps, a school health census, and intensive field studies, with special reference to tuberculosis, typhoid fever, etc. It would also seem advisable to revise some of the special regulations now in force.

The morbidity reports received by the State board of health under the present regulations are of little utility from an epidemiological standpoint and are not as full nor as accurate as they should be for statistical purposes. It is obvious that reports of this kind which are a month old are of no value except as a matter of history.

In order that the State board of health may keep in close touch with diseases occurring within the State, the original morbidity reports should be sent direct to the State commissioner of health by the local health officers. These local health officers should be

required to keep either a transcript or such other record as would give them the necessary information to carry out adequate preventive measures. They should also send immediately to the county or district health officer a daily report giving a summary of the diseases reported, so that he may be able to exercise the necessary supervisory control acting for the State board of health.

In addition to morbidity reports, local health officers should be required to submit a report stating the date of release of quarantine. Cards of information submitted, with material for laboratory examination, should be devised, so that they could be filed away in lieu of the original morbidity report.

As the collection and disposition of morbidity reports is one of the most important functions of a modern health organization and is part of the scheme for eradicating the preventable diseases, it would seem advisable to pass a law following more or less closely the model State law for morbidity reports.

In case such a law failed of passage, the State board of health has already sufficient power to make regulations requiring that morbidity reports be submitted direct to the State board of health and that quarantine release cards be required from local health officers. A law is preferable, not only because it is stronger than a regulation, but because it is desirable that uniform legislation be enacted in all the States.

With the inauguration of a more complete system of procuring morbidity reports and quarantine release cards, the work of the laboratory would unquestionably greatly increase, and with a better organization it would enable the State to do a great deal more work in assisting the practicing physician or health officer to make prompt diagnosis by scientific methods.

Branch laboratories are not only of assistance to physicians practicing in the locality, but are even of more help to the health officer, and the State board of health should be so situated that it could establish and maintain them either independently of, or with the financial assistance of, the locality.

PUBLIC HEALTH ENGINEERING ACTIVITIES.

Control of Water Supplies.

The commissioner is authorized upon the request of local authorities to investigate and advise in respect to obtaining a pure water supply or disposing of sewage or garbage.

There is, however, no division of the State board of health which has charge of this matter, and there is little or no law on the subject of control.

Surveys are made from time to time by the commissioner of health or his deputy, neither of whom is a sanitary engineer, and expert

advice is obtained from the officials of the engineering department of the University of Washington, who are also called upon for some field work.

Bacteriological analyses of water are made in the laboratory of the State board of health and chemical analyses for the board in the chemical laboratory of the university from samples furnished by local health officers or others, or from samples collected by the officials of the State board of health.

Requirements of law.—The law bearing on the subject of the control of water supplies gives no power to the State board of health, but does give certain powers to local authorities to protect their watersheds. It is summarized as follows:

The State law passed in 1907 gives the power to cities and towns within the State to police the watershed from which their water supply is secured. The city or town is given jurisdiction over such territory and may pass ordinances for the purpose of maintaining the purity of the water.

This law further defines what may be considered a nuisance on any such watershed, specifically mentioning the maintenance of any slaughter pen, stock-feeding yards, hogpens, or the deposit or maintenance of any uncleanly or unwholesome substance, or the conduct of any business or occupation, and provides a fine of not to exceed \$500 for creating or maintaining a nuisance.

The law specifies the procedure to be used in abating a nuisance and places the responsibility upon certain of the city officials.

It also gives authority to a city furnishing its people with water, or to private companies furnishing water to the citizens of any city, to obtain an injunction by civil action.

In addition to the above there are two other provisions of law to be found in the statutes.

It is prohibited to deposit any matter or thing dangerous or deleterious to health, or that could cause pollution, in any spring, well, stream, river, or lake, the water of which is or may be used for drinking purposes, or to deposit such on any property controlled by a municipality or corporation or person as a watershed for a public or private water system.

Another provision makes it a gross misdemeanor for an owner, agent, manager, or other person having charge of any waterworks furnishing water for public or private use to knowingly permit or commit any act by which the purity or healthfulness of the water supply is impaired.

Requirements of regulations.—The regulations which have been promulgated by the State board of health to guarantee the purity of water supplies are as follows:

It is prohibited for any city or town to discharge its sewage into any body of water used for drinking purposes by another municipality until such sewage has been rendered harmless by a treatment approved by the State board of health.

The use, except by diversion, of the waters of any natural or artificial storage or distributing reservoir of any public water supply for commercial or industrial purposes is prohibited.

Camping, picnicking, or hunting upon the watershed, or boating, fishing, or bathing upon the watershed is prohibited.

It is prohibited to store or sell any natural ice within an incorporated city unless obtained from a source approved by the health officer.

Frequent observations made in the average small city emphasize the great value of a wise advisory and supervisory control of water supplies by the State. Too often a water system is installed without an adequate preliminary study by an expert, resulting in a supply that is disappointing, to say the least, or even a menace to the health of the community.

To secure the services of a competent engineer to study the situation preparatory to installing a water system is an expense which the small community is frequently not able to bear. It is essentially the duty of the State to provide such expert advice, so that the citizens, who pay the cost of installation, may feel assured that their funds have been wisely spent and that they have been provided with a safe and adequate water supply.

On account of the proximity of the Cascade and Olympic Mountain Ranges, the cities of the Pacific coast are in an enviable position as regards pure sources of water supply. Even so, examples may be found where inadequate preliminary study, lack of foresight, or incompetency has resulted in a supply which has not proven as satisfactory as had been anticipated.

In fact, no State can be considered abreast of the times until its State health department has a division or bureau of public health engineering, charged with the duties of advising and supervising in matters relating to water supplies, sewerage systems, the disposal of garbage and trade wastes, the control of industrial hygiene, and the sanitary control of public buildings. In this the State of Washington is lacking.

Of the larger cities, Seattle obtains its water from the Cedar River and owns most of the watershed. The sanitation of its camps, necessitated by construction work, is well looked after. Employees on the watershed, before employment, are tested for positive Widal reaction and are given prophylactic treatments against typhoid fever. The watershed is patrolled as well as can be expected. With very few exceptions colon bacilli are uniformly absent in samples of water examined.

The Cedar River is also used as a source of power for the city. There has just been completed, a few miles above the power house and 12 miles above the intake of the city water supply, a dam which will impound 8,000,000,000 gallons of water. It would seem advisable to move the intake up to the location of the power house, thereby reducing the size of the watershed and, therefore, the danger of pollution, for it is this portion that is in most danger of contamination by domiciles, the railroad, and by trespassers on the railroad right of way, which for 11 miles passes through the watershed.

Such a change of intake, however, could not be made until it is certain that an adequate amount of water could be obtained from the smaller watershed during dry weather and allowing for future growth of the city.

The right of way itself is completely prevented from becoming a source of pollution by extensive and carefully maintained engineering work, which has been described in detail in engineering and public-health literature, but this protection of the track does not prevent a considerable risk from deliberate pollution by trespassers using the right of way as a highway.

Tacoma secures its water supply from the Green River. It does not own its watershed, which covers more territory than is necessary, thus making it more difficult to patrol and more liable to pollution. In fact, the colon bacillus was frequently present even after the installation of a temporary hypochlorite plant, so a permanent chlorine plant has just been installed and is now in operation. On the watershed are a lumber camp and three sawmills, a freight division village, and, in general, entirely too many people to be consistent with safety. At the industrial camp a septic tank and filter bed have been installed by the city. Septic tanks are, however, rather uncertain in their action.

Like Seattle, the watershed of Tacoma is traversed in part by a railroad. The danger from railroads, however, is negligible if controlled by proper regulations.

The city of Spokane has an unusual water supply in that it is secured from three large dug wells close to the river and tapping an underground supply flowing toward the river. The water is excellent in quality and abundant in amount and the danger from contamination is remote.

Disposal of Garbage and Refuse.

While the officials of the State board of health take an active interest in the methods pursued by the different cities in the disposal of refuse, they are, for reasons already pointed out, unable to carry on any active studies and to exercise the necessary supervisory and advisory control, leaving it more or less to each city to work out its own problems. With one or two exceptions, methods of disposal are not satisfactory from the standpoint of public health nor from the standpoint of the taxpayer.

Disposal of Sewage.

The State board of health has little or no control over the disposal of sewage and the State is greatly in need of a law giving the board advisory and supervisory powers in this respect, and providing for an organization (a bureau of public health engineering) to study the

various sewage problems already presented and certain to develop in the future. Throughout the State sewage is with few exceptions disposed of in the raw condition. Both Seattle and Tacoma discharge it into salt water, as do all the cities of Washington on the Pacific coast—a safe method of disposal except where there is danger of polluting shellfish. The oyster industry in Washington is important and it will sooner or later be necessary to enforce regulations designed to prevent the contamination of oyster beds.

Most of the inland cities dispose of their sewage directly into fresh-water streams.

As a result of the contamination of sources of water supplies, several outbreaks of typhoid fever have occurred. For this reason a few cities have been compelled to install temporary hypochlorite plants. The contamination of fresh-water streams is especially serious in irrigated regions where water for irrigation is obtained from rivers into which cities empty their sewage. In these localities ranchers usually secure drinking water from shallow wells which receive the seepage from irrigation ditches or the water is pumped directly from the ditch and stored. The problem of furnishing a safe water under such conditions is difficult to solve. Few of the ranchers can be made to see the necessity of boiling or otherwise treating the water before using it for drinking purposes, and even though they take this precaution, a large number of ranch hands employed at certain times of the year will drink directly from the irrigation ditches. Many of these transient employees contract typhoid fever and are the means of disseminating the disease in different parts of the country. After a careful study of the situation it may be found justifiable to require cities to treat their sewage adequately before emptying it into streams.

Two of the smaller cities have installations for treating sewage before discharge. Both use the septic tank system. In one instance the effluent is passed through a filter bed before emptying into a creek; in the other the effluent is used for irrigating a small tract of land.

The city engineer of Spokane has been carrying on some investigations to determine the degree of pollution of the Spokane River resulting from the discharge into it of the sewage of that city and the amount of self-purification which takes place by the time it has reached the Columbia River. The results of one year's investigation have been published, but further investigation is necessary and will be continued.

Industrial Hygiene.

There is little law on this subject, and what there is is left for its enforcement in the hands of the bureau of labor. The labor commissioner has carried on some studies on the subject especially

among shingle-mill workers, as a result of which shingle mills are required to install proper methods for carrying off the dust which is detrimental to the health of the employees.

There has also been published by the commissioner of labor a handbook containing safety regulations applicable in factories, mills, and workshops.

There is no law which requires the reporting of occupational diseases.

Requirements of regulations.—The State board of health has issued regulations covering the sanitation of industrial camps, including logging and railroad camps. These regulations are summarized as follows:

Contractors must report to the State board of health the location of any industrial camp, and must keep such camp in a sanitary condition.

County health officers are required to report to the State commissioner of health, in January and June, the location of industrial camps within their jurisdiction, and immediately upon the establishment of a new camp.

It is the duty of contractors or other responsible persons to take all necessary precautions to prevent the introduction and spread of disease among their employees. Below are the instructions and recommendations relative to the proper sanitation of camps.

Camps should be established upon dry, well-drained ground.

Sink holes or small collections of water should be drained and filled.

The kitchen and stable should be at opposite ends of the camp, as far away from each other as practicable.

Eating houses should be next to the kitchen, then should come the bunk houses, and between the bunk houses and the stable the toilets.

The use of toilets by the men should be made obligatory and soil pollution absolutely prohibited.

A temporary incinerator should be constructed.

A man should be appointed whose special duty should be the collection of garbage and refuse.

Manure should be gathered and burned each day.

Fecal matter should be treated in the same way or in other approved manner.

Kitchens and eating houses should be effectively screened; it is also desirable to have bunk houses screened.

Garbage should be collected in tight cans and incinerated with the manure and other rubbish.

Nonflammable refuse should be buried.

Urinals should consist of open trenches limed with quicklime, fresh lime being added daily in the proportion of one-half barrel for 100 men.

Foodstuffs should be carefully screened against flies.

Systematic scrubbing of kitchens, eating houses, and bunk houses should be carried out.

Water should be secured from an uncontaminated source.

The sick should be isolated from the well.

Those handling food should be examined, particularly as to whether they have had typhoid fever within recent years.

The commissioner of labor in the State of Washington recognizes that the maintenance of sanitation in industrial camps is essentially

the duty of the State board of health, and he would be glad to see the scope of the work of that board so enlarged by legislation that it would include this subject. This does not go far enough, however. Industrial hygiene includes the maintenance of sanitation in places of employment and the prevention of disease among industrial workers. The latter is dependent not only on conditions in the factory but, in large degree, also on sanitary environments outside the factory.

The maintenance of sanitary conditions in both places should be looked after by the health department, which should be given the necessary authority and facilities to do so. Unless these functions and others of a public-health nature are properly correlated and placed under one department, there will be duplication of work, unnecessary expense, knowledge gained by one lost to the others, and the lack of opportunity for a public-health worker to perform several public-health duties at the same time. There are many functions of the State government that should be gathered together and placed in the State health organization. The precedent which has been established in forming a department of agriculture could be very well followed in forming a department of health.

Hotel Inspection.

Hotel inspection under the State law is carried on by the State hotel inspector and his deputies, who are not a part of the State board of health, but form an independent division of State government.

Requirements of regulations.—The regulations providing for the maintenance of sanitation in hotels are promulgated by the State board of health and enforced by the hotel inspectors; they are summarized as follows:

Plumbing of hotels must conform to the ordinances of the city wherein the hotel is located. If the city has no plumbing ordinances, the plumbing must conform to the ordinances of the nearest city having ordinances governing plumbing.

There must be one public toilet to every 30 rooms or fraction thereof, and at least one public urinal for every three toilets.

All toilets must be properly plumbed, and, where there is a public sewer, must be connected.

Where there is no sewerage system, open earth toilets are allowed but must be disinfected with dry lime daily, emptied at least twice each week, and thoroughly screened from flies.

Open toilets must be located at least 40 feet from any kitchen, dining room, or pantry openings.

No privy vaults are allowed except those of a sanitary type approved by the State commissioner of health.

In towns having no sewerage system, hotels with plumbing must provide for the disposal of their sewage in a manner satisfactory to the health officer.

Cesspools are allowed only upon the recommendation of the health officer with approval of the State commissioner of health.

Garbage must be kept in tight metal cans with metal covers and must be removed once daily.

Dining rooms, kitchens, and pantries must be efficiently screened against flies.

Outside sleeping rooms must have at least 500 cubic feet of air space for each occupant, and sufficient openings to provide for a minimum of 3,000 cubic feet of air per hour.

For inside sleeping rooms the minimum air space allotted is 1,000 cubic feet for each individual, with openings into rooms or halls so that a minimum of 3,000 cubic feet of air per hour may be obtained.

Whenever any hotel room has been occupied by a person suffering from a communicable disease it must not be used again until thoroughly disinfected.

The common drinking cup is prohibited in all hotel lobbies or public toilets.

Hereafter no building may be constructed or remodeled for hotel purposes that contains sleeping rooms not opening directly into the open air.

Hotel inspection should be placed under the jurisdiction of the State board of health. Such an arrangement would be highly desirable as it would mean economy, and it would place at the disposal of the State board of health the services of inspectors who would have sufficient time to perform other public-health duties in addition to hotel inspection.

SCHOOL HYGIENE AND CHILD WELFARE.

The State board of health has practically nothing to do with medical inspection of schools and school children, except in the promulgation of certain regulations which aim to prevent the spread of communicable diseases among the pupils and teachers.

Requirements of law.—A provision of law taken from the school code is summarized as follows:

No teacher, pupil, or janitor may attend school from any house in which there is smallpox, varioloid, scarlet fever, diphtheria, or any other communicable disease. Nor can he return to school from any such house until three weeks have elapsed from the beginning of convalescence of the patient, or upon the certificate of a reputable physician.

In the case of whooping cough, chicken-pox, and measles not of a malignant type, teachers, pupils, or janitors who have had the disease and entirely recovered may attend school.

No teacher, pupil, or janitor suffering from pulmonary tuberculosis is permitted to attend school.

Requirements of regulations.—The regulations which have been promulgated by the State board of health to prevent the spread of disease among school children are, briefly, as follows:

Children suffering from any disease requiring quarantine or isolation must be excluded from school. All children in the same family must be excluded as long as the disease exists in the family, unless specifically provided for by regulation.

No child, teacher, or janitor suffering with tuberculosis is allowed to attend or work in any school.

Health officers, upon the request of the county superintendent of schools, are required to inspect schools where tuberculosis is suspected.

If any pupil be tuberculous, he shall be excluded from school and can not return until proof is brought that such pupil is not suffering from tuberculosis. The same provision applies to teachers or janitors.

If they refuse examination, the board of directors must suspend the individuals until they bring satisfactory evidence that they are not suffering from tuberculosis, either pulmonary or laryngeal.

In addition to the diseases above mentioned as requiring exclusion, children may be excluded from any school who are suffering with the following:

Contagious conjunctivitis (including trachoma not in active stage), impetigo contagiosa, mumps, pediculosis, ringworm, scabies, or any suppurative disease of a foul or offensive nature. In the case of ringworm, scabies, or pediculosis the child may continue school at the discretion of the health officer if proper treatment is instituted.

All children in a community where smallpox actually exists must be excluded from school attendance until vaccinated, unless they can present a certificate from a legally qualified physician that they have been vaccinated successfully within seven years, or can give evidence that they have had smallpox.

Whenever any pupil, janitor, or teacher in any school is afflicted with any disease calling for disinfection, the building, room, or rooms must be disinfected before they may again be occupied.

Whenever any principal or teacher believes that a pupil is suffering from or has been exposed to any communicable disease requiring exclusion from school, the child may be sent home and a report made immediately to the local health officer. Such child can not again attend school until a certificate is presented from a qualified physician that the child is not suffering from any disease.

Whenever any State or local health authority deems it advisable to close a school on account of the prevalence of any communicable disease, a written notice must be served on the school board or responsible official, directing that the school or schools be closed immediately, and no such school may be reopened until authorized by the health officer.

There is, in fact, little or no attention paid to the medical inspection of school children in rural communities. A recent law has given the school boards of cities of the first class power to establish and conduct an organization for such work, which provision has been taken advantage of by some of the cities, including Seattle, Spokane, and Everett.

The medical inspection of schools and school children should be performed by the health department. The determination of the physical and mental status of school children and the measures taken for the improvement of the health of the individual during school age is merely a continuation of infant hygiene work, and is preliminary to those public-health activities that should be exercised throughout his productive and reproductive period, at which time he is of the greatest value to society.

From the point of view of the doctor of public health, there are six ages in the life of man requiring close study and supervision. First, the age of pre-conception comprised in the study of eugenics; then the age of intrauterine existence, recognized in the prenatal care of

mothers; then the tender age of infancy, followed consecutively by the school age, the vocational age, and old age. Through all these ages diseases are endeavoring to destroy man's usefulness through the agency of pathogenic organisms, faulty environment, dangerous occupations, unwholesome diet, and a tainted inheritance. Such diseases are preventable.

It is obvious that work in these different fields of public health activities would soon overlap, and if carried on independently by workers not in sympathetic cooperation with each other there would result duplication of effort and lack of utilization of knowledge gained by each separately. Keeping in mind that in each field of activity the problem is the control of the preventable diseases, the logical body to assume such control and direct this work would be the health department.

Specifically, the reasons why the medical inspection of schools and school children should be placed in the health department are as follows:

1. The subject is not alone a school problem, but one of much greater scope, viz, that of suppressing the preventable diseases, and is, therefore, a public health problem.

2. There will be prevented a duplication of work and an unnecessary expense.

3. There will be made available to the health department useful information obtained by the school nurses and physicians.

4. The nurse will be enabled to perform other necessary public health duties while visiting the home in her capacity of school nurse.

5. Schools play such an important part in the dissemination of infection that the health department becomes vitally interested through its efforts to suppress and prevent the communicable diseases.

Proper sanitary conditions must be created and maintained. This problem does not differ materially from the same problem elsewhere.

In connection with the study of school hygiene, the State board of health should carry on work in infant morbidity and mortality and child welfare, and this work can readily be taken up by those engaged in school work.

There is at present a movement to secure legislation providing for the regulation of boarding houses for children. This is in line with child welfare work and should be placed for its enforcement in the State board of health.

CONTROL OF MILK SUPPLY.

The control of the milk supply is under the jurisdiction of the dairy and live stock commission, which was one of the offices that was recently combined with others to form a department of agriculture.

The laws and regulations which are in force to maintain the purity of the milk supply are similar to those in other States upon which reports have already been made, and it is not thought necessary to summarize them here.

Four inspectors are engaged in enforcing these regulations. It is impossible, however, for only four men to cover the territory and secure satisfactory results.

It has been pointed out in previous reports that milk is the one food in which a health department is most vitally interested, because it has a highly important bearing on the transmission of disease and on the causation of infant morbidity and mortality. The control of the milk supply, therefore, should be placed in the hands of the health department. If a dairy and food commission had a sufficient number of employees and would look at the question more from a public health than from an economic standpoint, such a commission might be able to handle the problem satisfactorily from the point of view of the health department. Under the present régime it is likely that more attention will be paid to the improvement of creamery products than to the safety of the milk supply used as an article of food.

A few cities within the State maintain a division of milk inspection as a part of their health department. The work of such division includes an inspection of the producing farms as probably its most important function.

When cities are located within easy reach of each other—for instance, Seattle, Tacoma, and Everett—a single producing farm may supply milk to two or more cities, which means that if an inspector from each city is attempting a supervision over that farm, there may be a duplication of work and a conflict of ideas and authority. For this reason a comprehensive State law for the control of the milk supply is advisable. This law should be enforced by State officers, preferably officials of the health department. If the State health organization is furnished with the necessary number of district health officers, as will be recommended further on in this report, the supervision of the producing farms and the enforcement of the State law should be made one of their most important duties. They should cooperate fully with local inspectors and with the inspector of the State dairy and live stock commission. They should keep in mind that the improvement of the milk supply does not depend so much upon the use of arbitrary police powers as upon the carrying on of a wise educational campaign among the farmers.

The creamery and condensed-milk industries are important in the State, and the standards for milk used for the manufacture of creamery products and for evaporation should be the same as those for milk to be used as an article of food; otherwise it is difficult to enforce sanitary requirements.

DISSEMINATION OF INFORMATION.

Bulletins.—The State board of health issues a quarterly bulletin for the benefit of the health officers throughout the State. This bulletin contains information of interest to them relative to their official work, including vital statistics, the prevalence and control of communicable diseases, and new laws and regulations relating to public health.

Formerly this bulletin was issued as a monthly publication and then contained information of more popular interest, and an effort was made to have it reach teachers and others in addition to health officers.

This monthly bulletin had to be discontinued on account of a lack of funds. The amount of money which is allowed to the public printer—namely, \$1,500 per annum—for publishing literature of the State board of health is inadequate, and is consumed in printing the biennial report, the quarterly bulletins, the necessary forms, stationery, etc. A large part of it goes to printing blanks needed by the bureau of vital statistics. At present it would, therefore, be impossible to publish more than is being published, and a popular bulletin, such as has been suggested, for distribution in public schools is out of the question. In time, with an increased appropriation, the issuing of such a publication is advised.

Circulars of information.—Circulars of information have been issued for distribution to health officers and local registrars within the State, relative to the enforcement of the vital statistics act, etc., and from time to time there have been published circulars of information on popular subjects, which are used principally for distribution while exhibits are being made. These circulars cover the subjects of tuberculosis, diphtheria, scarlet fever, general sanitation, and others of interest.

Exhibit.—The exhibit of the State board of health was first shown at the Alaska-Yukon-Pacific Exposition, and during the years 1909, 1910, and 1911, was placed on the road and exhibited in all the larger towns of the State. From its inception an effort was made to make it of general public-health interest and not entirely an antituberculosis exhibit. It was shown usually in a church, a schoolhouse, or public building furnished by the local authorities. Stereopticon lectures were given by local people of prominence and by the commissioner and assistant commissioner of health, and to add to the interest a musical program was provided. The exhibit was transported by the railroad companies free of charge, the only expense to the State being that of the employee in charge and the officials of the State board of health who were to deliver lectures. Since 1911 the exhibit has been greatly reduced in size and has been shown only occasionally, as at State fairs and similar public functions.

The officials of the State board of health who accompanied the exhibit utilized the time spent in the town to make sanitary surveys.

Conferences.—There is held every year, at a place designated by the commissioner of health, a conference of State, county, and local health officers, to discuss public-health matters of interest in different parts of the State. This conference is not required by law, nor is there any law requiring that the health officers be reimbursed for their expenses. That rests entirely with the county commissioners or city councils. Many of these bodies refuse to reimburse their health officers for expenses incurred in attending these meetings, so that they must either pay their own way or remain at home. Even under these circumstances the conferences are fairly well attended, and are productive of a great deal of good.

Meetings of this kind are of such great importance in providing for an interchange of ideas and in keeping the health officers abreast of the times, that provision should be made by law for convening them. In this law there should also be incorporated a provision whereby a health officer could, as in other States, be paid his expenses from the State, county, or city. In fact, the attendance at these meetings should be made compulsory and their duration extended so that a greater number of subjects could be taken up and studied.

VITAL STATISTICS.

The State constitution, creating a local board of health, also provided for a bureau of vital statistics. The work involved in the collection and tabulation of vital statistics is, therefore, the only activity of the State board of health which is performed in an organized manner. On account of the lack of funds, and therefore the very small force of clerks employed by the board of health for all purposes, the vital statistics clerks must necessarily perform other duties.

Registration of Births and Deaths.

Requirements of law.—The law relative to vital statistics is similar to the United States Census Bureau's model law and is summarized as follows:

It is the duty of the State board of health to have charge of the system of registration of births and deaths and to prepare the necessary rules, forms, and blanks for obtaining such records, and to insure the faithful registration of same.

The secretary of the State board of health is ex-officio State registrar of vital statistics.

The State board of health is authorized to appoint, when necessary, an assistant State registrar and to employ as many clerical assistants as he may deem necessary to record, index, and classify the returns of vital statistics.

Any city or incorporated town is a primary registration district and every county, exclusive of the portion included within such incorporated cities or towns, is subdivided into registration districts by the State registrar.

The health officer of any city or incorporated town is the local registrar.

The State registrar appoints some suitable person to act as registrar for the district not included in cities and towns, a position which is held during the pleasure of the State registrar.

Each local registrar must immediately appoint, in writing, a deputy who shall be authorized to act in his stead in case of absence, death, illness, or disability.

The remains of any person whose death has occurred in this State may not be interred or otherwise disposed of until a properly filled-out death certificate has been filed with the local registrar. When a body has been shipped in from some other State and is accompanied by the proper papers these are accepted in lieu of a death certificate. When a body is to be taken from the registration district in which the death occurs, and interred in some other registration district, the removal permit which accompanies the body is authority for burial.

A birth and a death certificate must be filed with the local registrar for all stillborn children. The word "stillborn" is written on the birth certificate in place of the name and on the medical certificate of death the cause of death is given as "still-born," with the cause of the stillbirth, if known, whether a premature birth, and if born prematurely, the period of uterogestation, in months, if known. Both the birth and the death certificate must contain all the information required by law.

When a death occurs and no physician has been in attendance, it is the duty of the undertaker or the person acting as such, to notify the local registrar, who, if he be a legally qualified physician, must investigate the circumstances of the case and issue a certificate of death, noting upon the certificate the absence of medical attendance. If the local registrar is not a legally qualified physician, and the circumstances indicate that death may have occurred from other than natural causes, the local registrar must notify the coroner, who is authorized to sign the death certificate.

The undertaker or person acting as such is made responsible for obtaining the death certificate and filing it with the local registrar and for securing the burial permit. This permit must be delivered to the sexton or other person in charge of the place of interment. If a body has been shipped by a transportation company, the transit permit containing the local registrar's removal permit must be attached to the box containing the coffin, and upon reaching its destination is taken up by the local registrar, a burial permit being issued thereon.

No sexton or person in charge of the premises where interments are made may dispose of a body without the proper burial, removal, or transit permit. The sexton must note the date of interment, over his signature, on the burial permit and return the same to the local registrar within 10 days from the date of interment, or within the time fixed by the local board.

Sextons are also required to keep a record of all interments made in the premises under their charge, stating the name of the deceased, the place of death, date of burial, and name and address of the undertaker. These records are open to public inspection.

The law specifies the information required on birth certificates, death certificates, and burial permits.

It is the duty of the physician or midwife to file a properly and completely filled-out birth certificate with the local registrar of the district in which the birth occurs within 10 days after the date of birth. In the absence of a physician or midwife, a birth certificate must be filed by the father, or mother, or the householder or owner of the premises, the manager or superintendent of the public or private institution where the birth occurs.

If a birth certificate is presented without the given name a supplementary report blank is issued, which is filled in by the parents and filed with the local registrar when the child is named.

Physicians, midwives, and undertakers are required to register name, address, and occupation with the local registrar of the district in which they reside, and they are thereupon issued a copy of the vital statistics act, together with any rules or regulations that may be promulgated. Within 30 days after October 1 of each year local registrars are required to report to the State registrar the names and addresses of all physicians, midwives, and undertakers who have registered with them. No fee is charged for registration.

All superintendents, managers, or other persons in charge of hospitals, almshouses, lying-in or other similar institutions, public or private, are required to keep a record of the information required in a death certificate. If a patient be admitted for a contagious disease, the nature of the disease and place where contracted, if possible, must be noted.

The State registrar must prepare and issue the necessary blank forms for the registration of births and deaths.

All certificates of births and deaths received from local registrars must be carefully examined by the State registrar, and if incomplete or unsatisfactory must be corrected.

Physicians, midwives, undertakers, etc., are required to give such facts as they possess relative to a birth or death.

The State registrar is required to arrange, bind, and permanently preserve all certificates in a systematic manner, to keep a card index of all births and deaths registered, and to inform local registrars what diseases are considered infectious or communicable, in order that when death occurs from such diseases, proper precautions may be taken to prevent their spread.

It is the duty of the local registrar to supply the blank forms of certificates furnished by the State registrar to such persons as require them, and to see that they are properly executed. He is authorized to withhold burial permits if death certificates are not satisfactory.

The local registrar is prohibited from issuing a permit for a body dead of a communicable disease except under conditions prescribed by the State and local boards of health. He is required to number consecutively the certificates of births and deaths in separate series, a new series beginning with each calendar year; to make an exact copy of each certificate presented to him in a register of births and deaths provided for this purpose; and on or before the fifth day of each succeeding month must send to the State registrar the originals of all certificates filed with him during the preceding month. If no births or deaths have been registered, he must report this fact on a card provided for the purpose. Cities of the first class are permitted to keep their original certificates and forward copies to the State registrar.

Health officers receiving a salary and who are acting as local registrars are not permitted to receive fees.

Registrars appointed by the State registrar are entitled to a fee of 25 cents each for certificates of birth and death properly and completely made out, registered, and forwarded by them to the State registrar on or before the fifth day of the following month. They are also entitled to a fee of 25 cents for each "no birth" and "no death" card filed. These fees are paid quarterly by the county auditor upon certification by the State registrar.

The State registrar is authorized to furnish certified copies of births and deaths and must charge a fee of 50 cents for each copy furnished. When a search of the records is made but no certified copy issued, a fee of 50 cents per hour or fractional part thereof may be charged. A correct account must be kept of all fees so received, and moneys so collected must be remitted to the State treasurer quarterly.

Cities of the first class are also authorized to furnish certified copies of births and deaths, but the fees so collected are turned into the city treasury.

Penalties are provided for refusal or neglect to make out and deliver a medical certificate, for neglect or refusal to file a proper birth certificate, for disposing of a body

without having a burial or removal permit, for neglect or refusal on the part of any registrar to perform the duties imposed upon him, for altering any certificate of birth or death or any copy of the same, for any violation of the vital-statistics act, for giving false information, and for transporting a body without the necessary papers.

The law gives full authority to the State and local registrars to investigate violations of the vital-statistics act, and, when necessary, to bring the matter before the prosecuting attorney. Prosecuting attorneys are authorized to institute proceedings in court against persons violating the act.

Methods of procedure.—Monthly transmittals of birth and death certificates by the different registrars are accompanied by monthly statement cards, showing the total number of births and deaths registered and forwarded to the State registrar during the previous month. This summary is made on a special card, which also contains a place for requisition for supplies. The reverse side of the card is used for certifying to the fact that no births or deaths have been registered with them during the month. A space is provided on the monthly report card wherein the local registrar may note the fact that a birth has occurred in his district which has not been filed with him. A similar space is provided on the "statement of death" card wherein he may note that a death has occurred which has not been reported to him by the attending undertaker. The card used by cities and towns differs slightly from that used in rural districts.

The registrar of a town or city is called the "local" registrar, while registrars in the county are known as "rural" registrars.

The number of certificates forwarded each month to the State registrar by both local and rural registrars are counted and entered in a book with the date on which they were received. From this book is made up the certification to the county auditor of the number of births and deaths and "no birth" and "no death" cards filed by each rural registrar, and for which he is entitled to receive pay.

After certificates have been counted and entered they are placed in a temporary working file, and classified by counties and cities of the first class. Separate files are kept for births and deaths. They arrive with the serial number of the local registrar. Beginning on January 1 of each year, the birth and death certificates filed by each county and city of the first class are given a serial record number, beginning with No. 1, and running consecutively to December 31 of that year. This record number indicates the number of births and deaths filed by each county and city of the first class for each month. These birth and death certificates are also given a serial file number, beginning with No. 1 on January 1 of each year, and running consecutively to December 31 of that year. This file number indicates the number of births and deaths filed with the State registrar for the State up to any period.

Each certificate of death is given a classification number, and the needed statistical information is entered on a classification sheet,

containing 33 causes of death, according to the "International List of Causes of Death." Missing information is obtained from the local registrar, if possible, and is entered on the certificate in red ink. When the certificates have been numbered and classified they are placed in a permanent file, by counties and cities of the first class, preparatory to binding in volumes of 200 certificates each. Separate index cards are used to record births and deaths. The birth-index card contains the record number, file number, name, registration district, sex, and date of birth. The birth index card and the birth certificate are both printed on blue stock.

The death index card contains the record number, file number, name of deceased, registration district, sex, age, and date of death. The death index card and death certificate are both printed on white stock.

Registrars are furnished two forms of permits; one is a combination burial and removal permit, which is used in case of burial or removal from one registration district to another, when the services of a common carrier are not needed. The other is a disinterment permit; each permit has two stubs, one of which is retained by the local registrar, and the other by company owning the cemetery.

The transportation permit is made up of two parts, one being the certificate of the local registrar and the other the certificate of the licensed embalmer. These transportation permits are not numbered and are furnished licensed embalmers only; there being no duplicate, transportation companies are not required to return any part of the transportation permit to the State board of health.

A special card is used for registrars to report to the State registrar the appointment of their deputies, as required by law.

For the convenience of undertakers who are unable to secure a burial permit from the local registrar, because of inability to secure a death certificate, an emergency affidavit is furnished them, upon which they may obtain a burial removal permit, by setting forth in this affidavit the reasons why they have not been able to obtain the death certificate. This affidavit must be sworn to before a notary public, and is filed with the local registrar, and later sent to the State department of health.

Information.—For the information of those concerned, there has been printed a bulletin containing the vital statistics law, and another bulletin containing instructions and regulations for physicians, midwives, undertakers, and registrars.

For the information of the bureau, so that it may keep check on births and deaths that may not be reported, newspapers are taken from different parts of the State, and much of the field work includes an investigation into the efficiency of registration in the locality.

Registration of Marriages.

Requirements of law.—The following is a summary of the law relative to the registration of marriages:

The county auditor is required to keep a record of marriage statistics and he must render to the secretary of the State board of health, quarterly, or at such other times as the secretary may direct, a full and complete record of all marriages.

There is also in the State of Washington a law prohibiting certain people from marrying, which is summarized as follows:

Marriage between a woman under the age of 45 years or a man of any age (except he marry a woman over the age of 45 years) is prohibited when one of the contracting parties is a common drunkard, habitual criminal, epileptic, imbecile, feeble-minded person, idiot or insane person, or person who has been afflicted with hereditary insanity, with pulmonary tuberculosis in its advanced stages, or any contagious venereal disease.

No clergyman or other person authorized to solemnize marriages is permitted to perform a marriage ceremony between persons afflicted as above.

Before a marriage can take place the contracting parties must file with the county auditor an affidavit to the effect that they are not feeble-minded, imbeciles, epileptics, insane, drunkards, or afflicted with tuberculosis in its advanced stages, and in addition the affidavit of the male applicant must show that he is not suffering from venereal disease.

Marriage statistics are kept by county auditors, as required by law, but auditors do not all send in a summary of these statistics to the State board of health. In any event, the statistics are not full enough to be of much value.

Practice of Embalming.

Requirements of law.—The law regulating the practice of embalming is summarized as follows:

No person may follow the occupation of embalming without first having obtained a certificate of registration.

There is provided a board of examiners to consist of three persons. Two members of this board are appointed by the governor from among the licensed embalmers of the State, the third member of the board being the secretary of the State board of health.

Each member of the board receives a per diem of \$5 for actual services rendered, and is entitled to reimbursement for traveling expenses incurred in attending the meetings of the board.

The board must hold a public examination at least once in each year.

To obtain the right to take the examination the applicant must pay a fee of \$5. He must be 21 years of age, and should have had not less than two years' experience under a licensed embalmer in the State of Washington, or one year under a licensed embalmer and a course of instruction in a school recognized by the embalmers' examining board. He must also be of good moral character.

The examination is conducted in the following subjects: Anatomy, sanitary science, care, disinfection, preservation, transportation, and burial or other final disposition of the remains of deceased persons, and the rules and regulations of the State board of health relating to quarantine and communicable diseases. The applicant is also required to demonstrate his proficiency as an embalmer by operations on a cadaver. If the applicant passes the examination, he pays a further fee of \$5, which entitles him

to a certificate of registration. These certificates must be renewed each year, the renewal fee being \$1.

The board has authority to revoke, after a hearing, any certificate of registration, for drunkenness, conviction of a crime, obtaining license by fraud, immoral, unprofessional or dishonorable conduct, or for violations of the rules and regulations of the State embalmers' examining board.

The board is also empowered to recognize licenses issued to embalmers under authority of other States having similar requirements, provided that the other States reciprocate with the State of Washington.

The embalmers' examining board is authorized to prescribe rules and regulations for the preparation of bodies for burial or for transportation.

The secretary of the State board of health, being a member of the embalmers' examining board, is enabled to keep in close touch with the licensed embalmers and to secure their cooperation—a very necessary thing from the point of view of the registration of births and deaths. At the same time the determination of the qualifications of applicants is left, to a large extent, to the embalmers themselves, who form a majority of the board.

In the above law there are certain details of procedure mentioned which it is not thought necessary to summarize.

Discussion.

It is probable that practically all of the deaths occurring in the State of Washington are registered. As in other States, however, the registration of births is incomplete and will remain so until the State can carry on the needed educational campaign to show the value of birth registration.

The United States Census Bureau gives a crude death rate of 8.4 in the State of Washington for the year 1913. If this rate were standardized for age and sex it would become somewhat higher, and still higher if it were based on a closer estimate of population. It is believed that the estimate made by the Bureau of the Census gives the State more people than actually exist. The true death rate should therefore be about 10. Compared with other States, this figure seems very low; nevertheless, it must be accepted as approximately correct.

Because of this low death rate there are many who are self-satisfied and see little need for expenditures for public-health work. This is the wrong attitude to take. In reality the low rate furnishes an excellent argument for every effort being continued to keep it low and to reduce it still further. While nature may be kind in furnishing a healthful climate, man is prone to spread infection broadcast. The health department therefore must be continually on the alert and prepared to meet emergencies.

It has been found in Washington, as in other States, that practicing physicians do not make good local registrars, except, perhaps, in instances where the physician employs a clerk who can perform the duties of local registrar for him. The Washington laws permit a

village to become an incorporated municipality when it has a population of 500 or over, so there are within the State a large number of small incorporated cities, each one with a health officer, who is a practicing physician, and who receives a very small salary. According to the law the health officer must act also as local registrar. The friction arising from competition which so frequently exists between practicing physicians in a small community makes it undesirable to have any one of them act either as health officer or local registrar. Not only does he incur the enmity of the community if he is strict in the performance of his duty, thus injuring his practice, but if he is disliked by one or more of the other practicing physicians they will not report to him. There should be another amendment to the vital statistics act authorizing the State registrar of vital statistics to appoint local registrars in municipalities under 5,000, instead of being required to utilize the services of the health officer for that purpose, as at present.

Table of information relating to birth and death registration for the nine months ended Oct. 31, 1914.

| Counties. | Municipal registration districts. | Districts numbered from— | Rural registration districts. | Districts numbered from— | Municipal. | | | Total births, deaths, and cards for municipal district. |
|-------------------|-----------------------------------|--------------------------|-------------------------------|--------------------------|---------------------|---------------------|---|---|
| | | | | | Birth certificates. | Death certificates. | Cards reporting no births or no deaths. | |
| Adams..... | 6 | 1 to 6 | 4 | 1 to 4 | 48 | 24 | 22 | 94 |
| Asotin..... | 2 | 1 to 4 | 4 | 1 to 4 | 25 | 13 | 5 | 43 |
| Benton..... | 3 | 1 to 3 | 5 | 1 to 5 | 49 | 17 | 14 | 80 |
| Chehalis..... | 7 | 1 to 7 | 6 | 1 to 6 | 460 | 215 | 30 | 705 |
| Chelan..... | 5 | 1 to 5 | 5 | 1 to 5 | 165 | 85 | 17 | 267 |
| Clallam..... | 2 | 1 to 2 | 6 | 1 to 6 | 4 | 1 | ..... | 5 |
| Clarke..... | 6 | 1 to 6 | 6 | 1 to 6 | 168 | 119 | 44 | 331 |
| Columbia..... | 2 | 1 to 2 | 4 | 1 to 4 | 61 | 34 | 8 | 103 |
| Cowlitz..... | 4 | 1 to 4 | 6 | 1 to 6 | 62 | 31 | 31 | 124 |
| Douglas..... | 3 | 1 to 3 | 8 | 1 to 8 | 48 | 10 | 32 | 90 |
| Ferry..... | 1 | 1 | 10 | 1 to 10 | 13 | 5 | 10 | 28 |
| Franklin..... | 3 | 1 to 3 | 4 | 1 to 4 | 56 | 22 | 11 | 89 |
| Garfield..... | 2 | 1 to 2 | 2 | 1 to 2 | 31 | 16 | 2 | 49 |
| Grant..... | 7 | 1 to 7 | 8 | 1 to 8 | 25 | 13 | 80 | 118 |
| Island..... | 2 | 1 to 2 | 6 | 1 to 6 | 4 | 3 | 14 | 21 |
| Jefferson..... | 1 | 1 | 9 | 1 to 9 | 38 | 36 | 2 | 76 |
| King..... | 15 | 1 to 15 | 27 | 1 to 27 | 4,076 | 1,991 | 121 | 6,188 |
| Kitsap..... | 4 | 1 to 4 | 8 | 1 to 8 | 94 | 57 | 23 | 174 |
| Kittitas..... | 4 | 1 to 4 | 4 | 1 to 4 | 100 | 54 | 14 | 168 |
| Klickitat..... | 2 | 1 to 2 | 5 | 1 to 5 | 20 | 13 | 15 | 48 |
| Lewis..... | 6 | 1 to 6 | 13 | 1 to 13 | 183 | 135 | 28 | 346 |
| Lincoln..... | 8 | 1 to 8 | 6 | 1 to 6 | 101 | 50 | 53 | 204 |
| Mason..... | 1 | 1 | 3 | 1 to 3 | 21 | 7 | 3 | 31 |
| Okanogan..... | 9 | 1 to 9 | 20 | 1 to 20 | 19 | 4 | 25 | 48 |
| Pacific..... | 3 | 1 to 3 | 5 | 1 to 5 | 158 | 67 | 12 | 237 |
| Pend Oreille..... | 4 | 1 to 4 | 3 | 1 to 3 | 19 | 10 | 38 | 67 |
| Pierce..... | 13 | 1 to 13 | 17 | 1 to 17 | 1,397 | 932 | 57 | 2,386 |
| San Juan..... | 1 | 1 | 3 | 1 to 3 | 9 | 3 | 11 | 23 |
| Skagit..... | 9 | 1 to 9 | 6 | 1 to 6 | 263 | 112 | 53 | 428 |
| Skamania..... | 1 | 1 | 4 | 1 to 4 | ..... | ..... | ..... | ..... |
| Snohomish..... | 11 | 1 to 11 | 11 | 1 to 11 | 544 | 297 | 46 | 887 |
| Spokane..... | 10 | 1 to 10 | 20 | 1 to 20 | 1,701 | 977 | 67 | 2,745 |
| Stevens..... | 6 | 1 to 6 | 9 | 1 to 9 | 58 | 33 | 35 | 126 |
| Thurston..... | 4 | 1 to 4 | 5 | 1 to 5 | 143 | 82 | 33 | 258 |
| Wahkiakum..... | 1 | 1 | 3 | 1 to 3 | 5 | 1 | 15 | 21 |
| Walla Walla..... | 3 | 1 to 3 | 6 | 1 to 6 | 233 | 158 | 24 | 415 |
| Whatcom..... | 7 | 1 to 7 | 6 | 1 to 6 | 460 | 237 | 24 | 721 |
| Whitman..... | 16 | 1 to 16 | 16 | 1 to 16 | 251 | 120 | 133 | 504 |
| Yakima..... | 9 | 1 to 9 | 9 | 1 to 9 | 334 | 159 | 76 | 569 |
| | 203 | ..... | 302 | ..... | 11,446 | 6,143 | 1,228 | 18,817 |

Table of information relating to birth and death registration for the nine months ended Oct. 31, 1914—Continued.

| Counties. | Rural. | | | | Grand total births, deaths, and cards. | Amount expended in birth and death certificates in rural districts. |
|-------------------|---------------------|---------------------|--|---|--|---|
| | Birth certificates. | Death certificates. | Cards reporting no births and no deaths. | Total births, deaths, and cards for rural district. | | |
| Adams..... | 90 | 22 | 21 | 133 | 227 | \$33.00 |
| Asotin..... | 77 | 32 | 23 | 132 | 175 | 32.25 |
| Benton..... | 95 | 39 | 34 | 168 | 248 | 38.00 |
| Chehalis..... | 117 | 52 | 59 | 228 | 933 | 51.75 |
| Chelan..... | 159 | 67 | 20 | 246 | 513 | 54.75 |
| Clallam..... | 154 | 75 | 53 | 282 | 287 | 60.50 |
| Clarke..... | 251 | 84 | 21 | 356 | 687 | 83.25 |
| Columbia..... | 61 | 18 | 36 | 115 | 218 | 25.00 |
| Cowlitz..... | 88 | 25 | 33 | 146 | 270 | 42.25 |
| Douglas..... | 111 | 33 | 78 | 222 | 312 | 47.00 |
| Ferry..... | 26 | 9 | 46 | 81 | 109 | 41.00 |
| Franklin..... | 28 | 10 | 42 | 80 | 169 | 17.25 |
| Garfield..... | 40 | 21 | 17 | 78 | 127 | 17.00 |
| Grant..... | 75 | 34 | 70 | 179 | 297 | 38.75 |
| Island..... | 66 | 21 | 47 | 134 | 155 | 28.25 |
| Jefferson..... | 44 | 14 | 103 | 161 | 237 | 37.50 |
| King..... | 610 | 261 | 175 | 1,046 | 7,234 | 230.75 |
| Kitsap..... | 185 | 111 | 37 | 333 | 507 | 69.00 |
| Kittitas..... | 143 | 80 | 9 | 232 | 400 | 53.25 |
| Klickitat..... | 105 | 51 | 29 | 185 | 233 | 39.00 |
| Lewis..... | 328 | 114 | 61 | 503 | 849 | 117.00 |
| Lincoln..... | 145 | 63 | 33 | 241 | 445 | 50.00 |
| Mason..... | 27 | 25 | 27 | 79 | 110 | 17.50 |
| Okanogan..... | 121 | 58 | 83 | 262 | 310 | 52.25 |
| Pacific..... | 96 | 47 | 24 | 167 | 404 | 37.75 |
| Pend Oreille..... | 40 | 16 | 14 | 70 | 137 | 17.25 |
| Pierce..... | 264 | 248 | 114 | 626 | 3,012 | 136.25 |
| San Juan..... | 64 | 21 | 21 | 106 | 129 | 23.00 |
| Skagit..... | 195 | 104 | 29 | 328 | 756 | 70.00 |
| Skamania..... | 26 | 20 | 47 | 93 | 93 | 21.00 |
| Snohomish..... | 264 | 138 | 49 | 451 | 1,338 | 97.75 |
| Spokane..... | 282 | 236 | 131 | 649 | 3,394 | 140.00 |
| Stevens..... | 189 | 93 | 54 | 336 | 462 | 75.50 |
| Thurston..... | 115 | 71 | 28 | 214 | 472 | 48.50 |
| Wahkiakum..... | 21 | 10 | 18 | 49 | 70 | 12.00 |
| Walla Walla..... | 111 | 53 | 23 | 187 | 602 | 41.25 |
| Whatecom..... | 255 | 120 | 14 | 389 | 1,110 | 82.75 |
| Whitman..... | 305 | 97 | 86 | 488 | 992 | 108.00 |
| Yakima..... | 408 | 169 | 37 | 614 | 1,183 | 139.50 |
| | 5,781 | 2,762 | 1,846 | 10,389 | 29,206 | 2,336.75 |

No record is kept of fees that may be received by municipal registrars.
The vital statistics act was not put into effect until Feb. 1, 1914.

COOPERATION BETWEEN FEDERAL, STATE, AND LOCAL HEALTH OFFICERS.

Maritime quarantine.—In addition to the laws already summarized, there exist a number pertaining to maritime quarantine which, since the United States Public Health Service has taken over the inspection of incoming shipping, are obsolete.

There is one, however, which is still valuable and which authorizes local health officers to inspect, quarantine, and disinfect vessels, with their cargoes and passengers, when such vessels are engaged in intrastate traffic, and are infected or suspected of being infected with communicable disease.

The quarantine laws of the United States, on the other hand, relate to interstate commerce. The above provision of law, therefore,

proved valuable upon the finding of rat plague in the city of Seattle, in cases where vessels refused local fumigation. The service representative in charge of the antiplague measures in Seattle has been made a deputy State health officer, in order that he may utilize the provisions of this law in enforcing the requirements relative to the fumigation of outgoing vessels engaged in intrastate traffic.

Bubonic plague.—This disease has been present in Seattle since the fall of 1907, at which time there were several human cases. The State and city health authorities, in cooperation with the Public Health Service, carried on at that time extensive operations for a period of several months, but when plague became confined to rodents the work was carried on by the city health authorities alone. A great deal of good work has been done in the past by the city authorities in the condemnation and removal of old buildings that were rat harbors, the concreting of basements, the regulation of stables, and the carrying out of other measures incident to a plague campaign. On two occasions it was thought that plague had been eradicated, as a period of 18 months, and two years, respectively, elapsed between the finding of infected rats. It is doubtful if plague has ever been even temporarily eradicated from Seattle since its first introduction.

No other locality in the State of Washington, however, has ever been infected so far as known. Since the beginning of plague operations in 1907 the city of Seattle has always maintained a force of men to trap and poison rats and collect dead rats, partly as an eradication measure and partly as a check on the presence of plague. This force has varied from 4 to 30 men, and at present consists of 8 men engaged in the work.

In December, 1913, the supervision of the trapping and poisoning of rats, and the picking up of dead rats was placed by the city authorities in the hands of the United States Public Health Service. A force of 25 men, supervised by 5 trained rat catchers of the service, spent three months covering the entire city for the purpose of determining just how far the infection extended. This delineation of the infected zone indicated that the infection is practically confined to a small area, perhaps less than one-tenth of the total area of the city, principally along a certain portion of the water front.

This probably means that the class of buildings, construction, etc., in nine-tenths of the city is such as to harbor comparatively few rats, and plague, even though introduced by rats from the central part of the city, dies out in these districts. Trapping operations indicate very few rats in residence sections.

With the change in administration, both in the mayor's office and the Commission of Health of Seattle, last April (1914), the supervision and direction of all plague-suppressive measures was by agreement taken over by the Public Health Service, the city of Seattle

agreeing to furnish necessary labor for the successful prosecution of the work. On account of heavy expenditures in other directions the present plague force is perhaps too small for safety. Certainly eradivative measures in the infected zone ought to be prosecuted much more vigorously than at present.

Shortly after the present city administration came into office an effective rat-proofing ordinance applying to new buildings was passed by the city council and this ordinance is being scrupulously enforced. With regard to old buildings, however, proceedings are much less satisfactory, though the health department in cooperation with the Public Health Service is continually condemning old buildings or parts of buildings and having them renovated, reconstructed, or razed. This work should proceed much more rapidly than at present.

No adequate regulation for the keeping of chickens has ever been authorized by the city council. Such a measure is important for the prevention of plague. A reasonable ordinance was recently submitted by the mayor to the city council, applying to a small area of the city, but was rejected by the council on the protest of a handful of commission men who deal in chickens. As a matter of fact, the present city council, as a body, is said to be generally opposed to plague-suppressive measures, and is disposed to minimize, and even sometimes doubt, the existence of plague infection in Seattle. In the fall of 1913 the appropriation to provide for enough rat catchers to delineate the infected zone was voted by the council under protest.

Practically no effort has ever been made to inform the citizens of Seattle of the status of plague in their city and to educate them as to the best methods of dealing with a situation such as confronts the people of the State of Washington to-day. A campaign of education has several times been proposed, but has always been prevented on the ground that it might hurt business. Here it may be remarked that such a campaign need not be carried on in newspapers. Public lectures and printed information sent to the individual are perhaps the best means of disseminating information on this subject, especially if civic bodies and organizations, such as clubs, unions, retail associations, chambers of commerce, commercial clubs, etc., can be induced to distribute it. There are probably fewer than 50 citizens in the State of Washington who know just what the plague situation in their State is to-day and what may be its possibilities. The people and many officials do not realize that the present policy of just meeting the situation from day to day is penny wise and pound foolish; that 10 or 15 years from now they may be spending hundreds or even thousands of dollars for every dollar that is being spent to-day, and that if activities were sufficiently increased and the proper work done in the old buildings in the infected district in Seattle, plague

might in time be completely eradicated from the city, perhaps never to reappear if proper building laws are rigidly enforced.

The present city health officer and the service representative in charge in Seattle are doing everything possible under the circumstances. The mayor also is supporting plague-eradication measures earnestly. Were the other elements of the community as faithful in their support of these measures, speedy eradication of the infection would follow.

With regard to the attitude of the State board of health to plague in Washington, it may be described as an almost helpless willingness to do anything that should be done. The State of Washington, rich as it is, has not one dollar available to combat plague. The State commissioner of health is cognizant of the needs of the situation and has asked for an appropriation to meet emergencies, such as an outbreak of plague, but none has been made. When the sharp recrudescence occurred in Seattle in the fall of 1913, the State commissioner of health was in the unenviable position of being obliged to take measures to prevent plague from being carried from wharves in Seattle to wharves in places like Tacoma, Bellingham, and Everett, with no funds for the work. He accordingly requested the Surgeon General of the Public Health Service to allow his local representative to be appointed a deputy health commissioner (without pay), thus clothing him with authority to take the same precautions with local shipping as were being taken with interstate vessels. By drawing on the limited funds at the command of the State board of health, funds which should have been used for other work, the services of one inspector were placed at the disposal of the Public Health Service until such time as this small fund was completely exhausted. No blame may be imputed to the State board of health or the State commissioner of health for this lack of funds. The responsibility rests, of course, with the State legislature, which failed to provide them.

The question arises, Is plague in the State of Washington confined to the city of Seattle, or are other ports infected? During the winter of 1913 the cities of Tacoma, Everett, Hoquiam, and Aberdeen each employed from one to two rat catchers, and the search for plague in these cities was continued for from 60 to 90 days. The bacteriological work of examining the rats caught in these places was done by an officer of the United States Public Health Service. No plague was found.

This Service now has one inspector who spends a part of his time in Tacoma, a part in Everett, and a part in Bellingham. It is his duty to trap rats and pick up dead rats, in order that they may be examined for plague. To date, no infection has been found in any of these cities.

It would appear that measures should be taken in places other than Seattle, on Puget Sound, and the Pacific coast of Washington. These are summarized as follows:

(a) All such cities should have a model law requiring the ratproofing of all new buildings and buildings undergoing extensive repairs. A trained man should be employed to see that this law is properly enforced; otherwise it would do no good.

(b) At least two good rat catchers should be employed to trap rats and pick up dead rats the year round as a check on the presence of plague. Seattle being infected, it is not just to cities in other States to take it for granted that the other coast cities in Washington are free from plague unless some means of determining its presence or absence are taken.

FIELD FORCES, ACTIVE AND POTENTIAL.

There is but one inspector employed by the State board of health. In consequence it is necessary for the board to depend almost entirely upon the local health authorities to enforce the State laws and regulations.

Local Health Authorities.

Requirements of law.—The law relating to local health authorities is summarized as follows:

The board of county commissioners constitute the county board of health.

The county board of health has jurisdiction within the county exclusive of cities of the first class.

The county board of health appoints a legally qualified physician as county health officer, whose term of office is two years and whose compensation is fixed by the board.

The county health officer is ex-officio a member of the board and is its executive officer. He may or may not be required to act as county physician.

The county board of health is also authorized to appoint the necessary assistants to serve during the pleasure of the board.

If a county board of health neglects or refuses to appoint a health officer, the State board of health may make the appointment for that particular term and fix the compensation.

The county board of health is subject to the supervision of the State board of health and is required to make such reports as the State board may direct.

In incorporated cities not of the first class, the mayor is required to appoint a legally qualified physician as health officer, the compensation to be fixed by the city council; his term of office is one year.

In cities of the second class having a board of health, such board must appoint the health officer.

County boards of health may make rules and regulations relative to the suppression and control of disease, which regulations take effect after approval of the State board of health.

They have authority to maintain an isolation or quarantine hospital, and to restrain, quarantine, vaccinate, or disinfect any person sick of or exposed to a communicable disease. Any action taken must be in accordance with the rules and regulations promulgated by them or by the State board of health.

The county health officer has supervision over matters pertaining to the preservation of the life and health of the people in his jurisdiction, subject to supervision by the State board of health.

He has authority to abate nuisances, and it is his duty, upon the appearance of any communicable disease within his jurisdiction, to investigate, make a full report, and take the necessary suppressive measures.

He has the power to remove to and restrain in an isolation hospital, or to quarantine or isolate, any person ill of a communicable disease. He is required to examine personally or by deputy every case before taking it to an isolation hospital.

He also has the power to vaccinate, and to disinfect any person or persons, room, house, building, article, etc., that may be considered infected.

Any health officer who refuses or neglects to obey or enforce the provisions of law, or the rules and regulations of the State board of health, or who refuses to make prompt and accurate reports to the county health officer or the State board of health, may be removed by the State board of health and may not again be reappointed, except with the consent of that body.

A regulation of the State board of health places health officers of cities of the first class in the same category as county health officers, and they are, therefore, required to make the same reports and to be governed by the same rules.

During the course of this study the following places were visited: Seattle, Tacoma, Aberdeen, Olympia, Hoquiam, Montesano, Port Townsend, Friday Harbor, Bellingham, North Yakima, Walla Walla, and Spokane.

The county health officers, with one exception, are practicing physicians and are, therefore, part-time men. While most of them, no doubt, earn the small salary which they are allowed, it is by no means large enough to warrant their giving more than a very small portion of their time to public-health work.

It is now generally agreed that for various reasons the duties of a practicing physician and those of a health officer are incompatible. This statement is applicable also to city and county physicians whose duty it is to treat the indigent sick, and health officers whose duties are the prevention of disease.

Instances are not infrequently seen where the county health officer is required to treat the county poor. This is not a health officer's work. He should, of course, have control of the isolation hospital but should be furnished a physician to administer treatment to patients isolated therein.

County health officers, being appointed by the county commissioners, are subordinate to them. The commissioners, who are laymen, control the policies and expenditures of their county health organization. Almost without exception such men are not sufficiently well informed on modern public-health procedures to pass upon such matters, and too often, with the idea of economy, will so limit the actions of the health officer that he becomes a mere figure-head. In fact, the health department is a favorite place for those in authority to practice economy.

The average city of any size should be able to take care of itself. It is in the rural communities and small towns that the activities of the county health officer should be mainly carried on, and his efforts will be productive of the best results if he is made a deputy State

health officer, and, therefore, responsible to the State commissioner of health. Until full-time men are employed under these conditions, the county health officer can be of little utility either to the county or to the State.

The county of Yakima and the city of North Yakima have combined on a 50 per cent basis to secure a full-time health officer, who receives \$3,000 per year. He has an assistant, who devotes his time principally to the county work. In a city the size of North Yakima this works out very satisfactorily because the population is probably not sufficiently large to warrant a full-time health officer for the city alone. In a city of 50,000 people or more there is, however, enough for one health officer to do without having the additional duties involved in county work. The results obtained since this system was inaugurated certainly warrant its continuance; nevertheless, the health officer feels that his position is very uncertain. The county commissioners are inclined to believe that here is a place where they might economize by appointing a health officer who will serve for less money; and, unfortunately, there are practicing physicians who, regardless of their lack of qualifications, will underbid their more conscientious colleagues.

The salary which an expert on public-health matters is entitled to should not be less than that received by a county judge. A doctor of public health is a physician who has devoted a great deal of his life to the study of medicine and public-health matters, and on his ability rests the health of communities and the life of individuals. Just as there is a judge for each county or district so there should be a health officer for each county or district. The remuneration should be commensurate, each devoting his entire time to official business.

Health department of Seattle.—Of the cities of the State, Seattle is the largest and has a very well organized health department under the control of a full-time health officer, who in the administration of his office is unhampered by restrictive orders from higher authority or by political considerations. This is due to the attitude of the present mayor in supporting the policies of the health officer.

Space does not permit of an extensive review of this department. Briefly, it is divided into seven parts—a division of sanitation, a division of communicable diseases, a division of tuberculosis control, a division of child welfare, a division of vital statistics and finances, a garbage division, and a city hospital division.

The division of sanitation is under the charge of a full-time man, at present an engineer, and comprises the following activities: Milk inspection, veterinary inspection, including the inspection of animals before and after slaughter, plumbing inspection, watershed inspection, chemical laboratory, and general sanitation, which latter in-

cludes the supervision of lodging houses and the inspection of foods, restaurants, bakeries, etc.

The division of communicable diseases comprises an isolation hospital, a division of district medical inspection, a quarantine division and a bacteriological laboratory.

The division of tuberculosis control includes the maintenance of a tuberculosis sanatorium, a dispensary, and a corps of nurses. Upon this division also falls the duty of issuing certificates of health to those employed in the preparation and serving of foodstuffs. In the case of waitresses or other females employed, these examinations are made by a woman physician. The object of these examinations is to exclude such persons as are suffering from communicable diseases, especially phthisis and venereal diseases, or who may be carriers of pathogenic organisms.

The division of child welfare is one recently formed and is at present engaged in the inspection and licensing of boarding houses for children and the examination of the teeth of children under school age.

The city hospital is essentially an emergency hospital though other than emergency cases are treated.

In the division of vital statistics is the office of local registrar for the city of Seattle. In addition to acting as local registrar the head of this division keeps the accounts of the department, buys supplies, etc.

The activities of the garbage division have already been mentioned.

All the officials of the health department, except the district medical officers, are full-time men. It would seem advisable and consistent to appoint full-time men to these positions. By so doing the number could be reduced and their efficiency greatly increased.

The fund of the health department of Seattle for 1914 amounted to \$444,640, and there has been provided for the year 1915, \$498,750. Out of this amount there must be defrayed the expenses of the entire department, including the collection and disposal of garbage, which will cost about \$258,180; the maintenance of an isolation hospital, which will cost about \$10,000; the maintenance of an emergency hospital, which will cost about \$26,000; and the maintenance of a tuberculosis sanatorium, which will cost at least \$105,000. It is very unusual to charge the cost of maintenance of emergency hospitals and tuberculosis sanatoria against the health department fund. Certainly the work involved in an emergency hospital is not that of a health department, and where a tuberculosis sanatorium is maintained the expenses should be paid out of a special fund, thus leaving the amount appropriated to the health department—which should not be less than 10 per cent of the total appropriations for the maintenance of city government—to be used for legitimate public health work. The health department collects for hospital treatment of pa-

tients, license fees, etc., approximately \$50,000 a year, but this money reverts to the general treasury.

The activities of the health department of the city of Seattle seem to be carried on with energy and efficiency.

The mortality among infants under 2 years of age in the city during the 12 months' period ended June 30, 1914, was 67.8 deaths from all causes for each 1,000 births, and 6.63 deaths from diarrhea and enteritis for each 1,000 births. The total deaths under 2 years of age from all causes was 327, while the total deaths under 2 years of age from diarrhea and enteritis was 32, with a total of 4,821 births registered, exclusive of stillbirths.

To some these figures may appear unreliable. However, it must be remembered that Seattle's climate is without the intense heat of summer or the intense cold of winter, such as is experienced in eastern cities; that congestion of population, and therefore the housing problem, is not a serious matter in this city; and that the officials are actively engaged in improving the milk supply, in which they are aided by the uniformly cool climate and the short hauls necessary in the transportation of the milk. A low infant mortality should be an indication of the character of the milk supply of a city, always, of course, making due allowance for other causes. The natural environment of the cities in western Washington is particularly conducive to a low infant death rate.

Health department of Spokane.—The city of Spokane also maintains a health department with a full-time health officer, receiving a salary of \$3,600 a year. The city is under the administration of a commission form of government. Observations in cities under this form of government have failed to demonstrate to the author of this report that the interests of the public health have been advanced under such system. In Spokane, for instance, the commissioner of health is one of the commissioners of the city and is a layman. The full-time health officer is subordinate to this commissioner, and a layman is more anxious to make a showing of economy in his department which will meet the approval of and strengthen him with the voters than he is to strengthen his health department, and thus advance the interests of public health. It requires a person who has made a study of the subject to realize that this is false economy.

The health department of Spokane employs a small force, including a quarantine officer, who is a physician, a quarantine nurse, a clerk, and six inspectors to supervise restaurants, stores, etc., milk supplies of the city, and matters involving sanitation. Six other persons are employed at the isolation hospital, which is maintained and controlled by the department of health. The laboratory in which the diagnostic work and water analyses are performed is under a differ-

ent commissioner, but the work of the bacteriologist is supervised by the health officer.

The health officer is an active man familiar with modern public health methods and should be given more support by the administration, both financial and moral.

During the visit to Spokane there was an epidemic of scarlet fever in which most of the cases were traceable to one school. This epidemic had been in progress for several months, and although the health department had been carrying on an active campaign against it, they were not securing the results that should be expected. The medical inspection of school children is under the control of the board of education, which employs five part-time physicians and one full-time nurse. Careful consideration of the situation pointed to the probability that the school physicians had not been devoting sufficient time to the examination of school children for the purpose of excluding those in the preliminary stages of the disease, or those who might be possible carriers as evidenced by sore throat. The health officer, of course, had no authority to take any action in the schools and had to confine his attention to the isolation of cases after they developed. This seems to be a good illustration of the desirability of having no subdivision of authority in matters concerning the physical condition of school children, and shows that the control should be placed in the health department.

Health Department of Tacoma.—The city of Tacoma is under a commission form of government. The health officer is a part-time man and is subordinate to the commissioner of health, who in this case is mayor of the city. The mayor is commissioner of health to such an extent that his salary and even that of his secretary are paid out of the funds appropriated to the health department. Out of this fund are paid also the salaries of persons whose duties are connected only in the most remote way with the health department. Thus, the amount appropriated for the health department is made to seem much larger than it really is. There are employed for legitimate public-health work, in addition to the health officer, a sanitary inspector, a quarantine officer, a bacteriologist and chemist, a pure-food inspector, a district nurse, and a clerk. The city also maintains a communicable-disease hospital. Compared with the other large cities in the State, it must be admitted that Tacoma is far behind in matters relating to health administration, nor does it appear, for the present at least, that there is any hope of increasing the efficiency of its health department. The health officer is not permitted to take the active part he desires, as such activity might be considered pernicious and would involve the expenditure of city money.

The following tabulation shows the amount of money that has been made available to the health departments of some of the cities

in the State, as well as giving other information of interest. Calculating the amount that a city health department should receive on a 10 per cent basis, which is very conservative, it is evident that the appropriations at present are inadequate.

| City. | Population estimated as of July 1, 1914. | Health officer. | Diagnostic laboratory. | Isolation hospital. | Emergency hospital, or medical relief to indigent sick. | Tuberculosis sanatorium. |
|-------------------|--|----------------------|------------------------|---------------------|---|--------------------------|
| Seattle..... | 313,029 | ¹ \$5,000 | Yes. | \$10,000 | ² \$26,000 | ² \$105,000 |
| Spokane..... | 135,657 | ¹ 3,600 | Yes. | \$9,930 | No. | No. |
| North Yakima..... | 18,737 | ¹ 3,000 | ³ Yes. | No. | No. | No. |
| Tacoma..... | 103,418 | ⁴ 1,200 | Yes. | \$5,530 | No. | No. |
| Hogquiam..... | 10,540 | ⁴ 1,200 | No. | No. | No. | No. |
| Bellingham..... | 29,937 | ⁴ 900 | No. | No. | \$500 | No. |
| Everett..... | 32,048 | ⁴ 1,200 | No. | No. | No. | No. |
| Aberdeen..... | 18,220 | ⁴ 600 | No. | \$650 | No. | No. |

| City. | Garbage collection and disposal in charge of health department. | Funds available to health department. | Funds available for maintenance of entire city government. | Per cent of funds available to health department. | Amount available on a 10 per cent basis. |
|-------------------|---|---------------------------------------|--|---|--|
| Seattle..... | \$258,180 | { \$498,750 (367,750) | \$4,962,624 | { 10 (7.4) | \$496,262 |
| Spokane..... | No. | 34,670 | 1,864,241 | 1.8 | 186,424 |
| North Yakima..... | \$9,578 | 20,832 | 334,260 | 6.0 | 33,426 |
| Tacoma..... | No. | ⁵ 20,265 | 1,113,628 | 1.8 | 111,362 |
| Hogquiam..... | No. | 1,978 | 110,043 | 1.7 | 11,004 |
| Bellingham..... | No. | 1,681 | 102,180 | 1.6 | 10,218 |
| Everett..... | No. | 4,560 | 200,735 | 2.2 | 20,073 |
| Aberdeen..... | No. | 2,000 | 160,000 | 1.2 | 16,000 |

¹ Full time.

² Deducting the cost of maintenance of the emergency hospital and the tuberculosis sanatorium from the total amount, there would remain \$367,750, or 7.4 per cent of the total budget for the entire city.

³ The county pays one-half of the health officer's salary and one-half the expenses of laboratory.

⁴ Part time.

⁵ The salary of the mayor and other expenses not chargeable to a health department have been deducted.

APPROPRIATIONS.

There were appropriated for the State board of health for the biennial period 1913 and 1914, \$30,000, or \$15,000 per year, as follows:

| | |
|--|--------------|
| Commissioner's salary..... | \$3,600 |
| Maintenance of board of health and bureau of vital statistics..... | 4,500 |
| General fund..... | 7,100 |
| | <hr/> 15,200 |

The revenues of the State for the year ended October 1, 1914, were approximately \$12,319,959. If to this amount there be added the balance from the previous year of \$2,371,769, there would be available to cover the expenses of State government, \$14,691,729. If from this amount there is deducted \$6,691,729 to cover extraordinary expenses, interest on bonds, revolving funds, and the like, there would remain \$8,000,000 for the general maintenance of the State government. The funds allowed the health department for the year

1914, namely, \$15,000, represent but 0.0018 per cent of this amount, being entirely inadequate, and compared to the appropriations in other States of equal size, exceedingly small.

The amount required to maintain an efficient health department, large enough to care for the public health of a State of the size and importance of Washington, should be not less than 2 per cent of the State's available revenues, which in this instance, basing the calculation on \$8,000,000, is \$160,000. This sum is considered necessary and reasonable to maintain the health department required, after the department shall have been fully organized.

In recommending appropriations in amount more nearly approaching these figures, it is not desired to cause any increase in taxation or to place an increased burden upon the people, but to bring about a more equitable distribution of the State's funds, so that those who are now receiving much may, by getting a little less, add to the fund of the State board of health.

It has been suggested that the revenue derived from taxing life insurance companies be utilized to pay the expenses of the health department. This idea would appear to be logical, inasmuch as life insurance companies are vitally interested in the prevention of disease and the prolongation of life, and render great aid to health departments through their visiting nurses and the dissemination of literature on the preventable diseases.

The State of Washington might follow the precedent established by Florida, where the State health department is supported by a tax levy of one-half mill. In Washington, however, a larger and richer State, this tax levy would not have to be nearly as great. The report of the tax commission for 1912 gives the assessed valuation of taxable property as \$1,005,086,000. In order to secure the amount required by the health department, as recommended above (\$160,000), there would have to be levied a tax of 0.00015 cents, or $\frac{1.6}{1000}$ of 1 mill, which would be equivalent to 1.6 cents for every \$100 of the assessed valuation.

EXPENDITURES.

The accompanying table shows the expenditures of the State board of health for the 12 months' period ended July 31, 1914.

The apportionment of these expenditures according to the activities is not absolutely accurate, as the system of bookkeeping charges the expenses against appropriations rather than against specific activities. It was, therefore, in some cases necessary to approximate the division of the amounts expended for different purposes. For this particular 12 months' period a deficit of \$240 is shown. This is only apparent, however, as it will be made up from moneys coming due during the next 12 months and not yet utilized, it being borne in mind that in

Washington appropriations are made for two years, and the relative rate of expenditure of all appropriations over the two-year period is left entirely to the discretion of each department head.

Statement of expenditures of the State board of health for the 12 months' period ended July 31, 1914.

| | Execu- tive office and board of health. | Educa- tional. | Vital statistics. | Epidemi- ology and sanita- tion. | Diag- nostic labora- tory. | Total. |
|--|--|-------------------|----------------------|---|-------------------------------------|-----------|
| Addressing machine and supplies..... | | | \$117.01 | | | \$117.01 |
| Blue prints..... | | | 21.50 | \$20.00 | | 41.50 |
| Books and subscriptions..... | \$96.35 | | | | | 96.35 |
| Camera supplies, printing, and developing..... | | | | 38.03 | | 38.03 |
| Conference dues..... | 10.00 | | | | | 10.00 |
| Cuts for bulletins..... | | \$66.06 | | | | 66.06 |
| Public-health exhibit..... | | 85.28 | | | | 85.28 |
| Express, cartage, freight, and storage..... | | 156.28 | 10.00 | | | 166.28 |
| Furniture..... | 23.38 | | 4.75 | | | 28.13 |
| Laboratory maintenance..... | | | | | \$94.45 | 94.45 |
| Laboratory supplies..... | | | | | 387.64 | 387.64 |
| Laundry..... | 9.40 | | | | | 9.40 |
| Mailing cases..... | | | | | 45.00 | 45.00 |
| Maps..... | | | 10.35 | | | 10.35 |
| Miscellaneous..... | 22.17 | | | | | 22.17 |
| Office supplies..... | 113.87 | | 112.00 | | | 225.87 |
| Per diem, special investigators..... | | | | 80.00 | | 80.00 |
| Postage..... | 148.22 | | 148.22 | | 100.00 | 396.44 |
| Press clippings..... | | | 80.00 | | | 80.00 |
| Rent..... | 600.00 | | | | 600.00 | 1,200.00 |
| Repair to laboratory apparatus..... | | | | | 13.50 | 13.50 |
| Repair to typewriter..... | | | | 3.00 | | 3.00 |
| Reprints..... | | | | 19.10 | | 19.10 |
| Salaries..... | 3,600.00 | | 2,400.00 | 2,820.00 | 1,240.00 | 10,060.00 |
| Telephone..... | | | 2.40 | 307.61 | | 310.01 |
| Telegrams..... | | | | 94.50 | | 94.50 |
| Traveling expenses..... | 548.92 | | 386.50 | 291.74 | | 1,227.16 |
| Traveling expenses, members of board..... | 283.76 | | | | | 283.76 |
| Typewriter..... | | | | | 30.00 | 30.00 |
| Total..... | 5,456.07 | 307.62 | 3,292.73 | 3,673.98 | 2,510.59 | 15,240.99 |

RECOMMENDATIONS.

As a result of a careful study of public health administration in Washington, continued over several months, a number of definite conclusions have been reached and previously stated. In effect, these conclusions are that the adoption and enforcement of measures for the protection of public health in the State have not kept pace with the growth of the State. Such health measures as have been enacted are more or less scattered among different branches of the government, whereas all these measures should be coordinated and their enforcement imposed on a single State health organization. Further provision should be made adequately to protect the public health, and necessary appropriations and facilities should be provided with which to carry out the necessary measures.

Based on the above summarized conclusions, certain recommendations are submitted, the adoption of which, it is believed, will meet the present public health needs of the State:

1. All public health activities now being performed by the State board of health and the activities relating to child hygiene, industrial

hygiene, school hygiene, sanitation of milk supplies, and hotel inspections performed by other governmental agencies should be brought together in a department of health.

2. The department of health should be subdivided into the office of the commissioner of health as the administrative head, the State board of health as the advisory and quasi-legislative body, both of which are now provided for by law, and the following bureaus:

Bureau of communicable diseases.

Bureau of public health engineering.

Bureau of industrial hygiene.

Bureau of child welfare and school hygiene.

Bureau of publications and instruction.

Bureau of vital statistics.

Bureau of property, records, and accounts.

3. The bureau of communicable diseases should include a division of epidemiology, a diagnostic laboratory, and a Pasteur institute. The division of epidemiology should have charge of the collection and disposition of morbidity reports, the prevention and suppression of communicable diseases, and the supervision of the medical officers at the headquarters of the department and district health officers in the field. In the diagnostic laboratory should be performed the duties usual to such laboratories, and the Pasteur institute should prepare and administer antirabic treatments.

4. The bureau of public health engineering should include a division of engineering, a division of sanitary inspections, and a water and sewage laboratory.

The division of engineering should have supervisory control over water supplies, sewerage systems, and disposal of garbage and trades wastes. The water and sewage laboratory should be for the performance of the duties usual to such laboratories. The division of sanitary inspections should have charge of the inspections of hotels and public buildings, plumbing inspection, and the abatement of nuisances.

5. The bureau of industrial hygiene should have charge of the sanitation of places where industrial workers are employed and the prevention of occupational diseases.

6. The bureau of child welfare and school hygiene should have charge of the health inspection of schools and school children and the studies in prevention of diseases of infancy.

7. The bureau of publications and instruction should have charge of all systematic measures for the dissemination of information, including the installation and management of public health exhibits, the delivery of public health lectures, and the preparation and distribution of educational literature.

8. The bureau of vital statistics should have charge of the registration of births, deaths, marriages, and divorces.

9. The bureau of property, records, and accounts should have charge of the property, records, and accounts of the department.

10. The State should be divided into not less than 15 health districts, each district to be composed of one or more counties at the discretion of the State department of health.

11. A physician trained in the science of public health should be placed in each district as district health officer and given an office and adequate number of assistants, including inspectors, nurses, and clerks. No one should be appointed until he has passed a thorough examination before the State department of health, and has otherwise proved himself capable of filling the position. He should first receive a probationary appointment, and he should be prohibited from engaging in any private business which would interfere with his official duties. He should hold office during efficiency and good behavior and receive an adequate salary, which, as he proves himself capable, should be increased at definite intervals until it has reached a maximum which in the judgment of the department of health is sufficient. He should be allowed actual and necessary expenses when traveling on official business.

12. The district health officer should be made responsible to the State department of health for the enforcement of State health laws and regulations, and, under the State department of health, have authority over county, city, and town health officials.

13. The powers and duties of the district health officer should be defined by law and include the enforcement of the law regarding the notification of cases of disease; the inspection of dairies, canneries, industrial camps, and all places of business or manufacture within his jurisdiction; the inspection of county schools and school children; the investigation of cases of illness and the institution of measures for the control of disease; the investigation of nuisances and the abatement of same; the keeping of complete records of transactions, and the forwarding of all necessary reports to the State department of health; the dissemination of information in his district; the enforcement of the laws relating to the registration of births and deaths; and the performance of all other duties that may be required of him by the State department of health.

14. The State should be divided into three districts, in each of which should be placed an officer who has received training in public health engineering, this field force to be under the supervision of the division of engineering. The sanitary engineer at the University of Washington should be appointed consulting engineer to the State department of health.

15. The field organization should be mobile, so that the district health officers and the district engineers, or their assistants, could be concentrated in any part of the State or in any city within the State

in case of emergency, or their transfer from one district to another effected in the interest of the public service.

16. Branch laboratories should be established at advantageous points throughout the State and placed under the control of the diagnostic laboratory in the bureau of communicable diseases.

17. The personnel of the department of health should be increased so as to adequately perform all the duties imposed upon it, including the appointment of a full-time chief for each of the bureaus and other necessary assistants.

18. All permanent officers and employees of the department of health, except the advisory board, should be "full-time" employees.

19. A comprehensive law should be enacted making it compulsory on the part of all persons interested to have plans for proposed installations of water supplies, sewerage, and refuse-disposal systems, approved by the State department of health. The State department of health should be empowered to require any changes or extensions in already existing installations that may be necessary to insure safe water supplies or proper sewage or refuse-disposal systems; or to order the installation of water-supply and sewerage or refuse-disposal systems in the absence of same. The State department of health should have the power to close or to prevent the use of water from any well, spring, or other source, that, in its opinion, is dangerous to health, or to require the filling or draining of places where there is any accumulation of water, breeding of mosquitoes, or other conditions dangerous to health.

20. The model law for morbidity reports with necessary modifications should be enacted in Washington, and should include a provision whereby the State shall submit to the United States Public Health Service the reports agreed upon between that service and the conference of State and Territorial health authorities.

21. A law should be enacted giving power to the State department of health to organize a system of health inspection of schools and school children in rural schools, and to supervise such work performed by cities.

22. The prevention of occupational diseases and the maintenance of sanitation in places employing labor should be placed under the control of the State department of health, and legislation should be enacted to give it all necessary power to act.

23. Health officers in cities of the third and fourth class should be appointed by the State department of health and should act also as deputy district health officers of the State. Such health officers should be residents of their respective localities.

24. Provision should be made by law for calling a conference of district and other health officers annually, or oftener, by the State

commissioner of health, the expenses so incurred to be paid by the State, county, or local authorities.

25. All plans of public buildings should be submitted to the State department of health for approval as to sanitary arrangements.

26. Tabulating machines should be installed in the interest of economy and efficiency.

27. Quarters large enough to accommodate the different divisions, as contemplated in this report should be furnished for the State department of health at Seattle.

28. Provision should be made for the free distribution of diphtheria antitoxin throughout the State.

29. A popular bulletin to be used especially for instructing children in the public schools should be issued monthly.

30. The methods of keeping accounts should be changed so as to allow an accurate determination of the exact cost of any bureau or division or any special work at any time.

31. Not less than \$160,000 per annum should be appropriated for the use of the State department of health. This should be allotted at the discretion of the department to its different bureaus, approximately, as follows:

| | |
|--|-----------|
| To the bureau of communicable diseases..... | \$25, 000 |
| To the bureau of public-health engineering..... | 20, 000 |
| To the bureau of industrial hygiene..... | 5, 000 |
| To the bureau of vital statistics..... | 10, 000 |
| To the bureau of school hygiene and child welfare..... | 10, 000 |
| To the educational bureau..... | 5, 000 |
| To the district health organization..... | 75, 000 |
| To the general fund..... | 10, 000 |
| | <hr/> |
| | 160, 000 |

32. In order to meet any emergency that may arise requiring the expenditure of money to combat an epidemic or to control a dangerous communicable disease, the legislature should set aside a fund of at least \$15,000, which may be spent upon the recommendation of the State commissioner of health, with the approval of the governor.



PRESENTED BY
PROF. G. H. F. RUTTALL

UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION
IN TOLEDO

BY

CARROLL FOX

Surgeon, United States Public Health Service

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PUBLIC HEALTH ADMINISTRATION IN TOLEDO. ¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of studies of health organization and administration in the city of Toledo, Ohio. The study was made at the request of the State Board of Health, the City Board of Health, and the Toledo Commerce Club. It was carried on for a period of four months and includes investigations in both the office and the field.

Toledo is a prosperous community with a population of 184,126 and is situated on both sides of the Maumee River at its mouth. This river empties into Maumee Bay, an arm of Lake Erie, and is of sufficient depth in the vicinity of Toledo to permit of the passage of the large lake freighters. Toledo is, therefore, an important lake port as well as an important railroad center.

Among its industries of magnitude may be mentioned automobile factories, plate glass, cut glass, and machine bottle-blowing works, smelters, foundries, flour milling, a beet-sugar mill, oil refineries, and other industries too numerous to mention.

For assistance and information received during the course of this study acknowledgment is made to the officials of the board of health especially to Mr. Sam F. Smith, clerk to the board; to the officials of the department of service and the medical inspector in charge of the health supervision of schools; to the officials of the different charitable organizations; to the secretary of the commerce club and the members of the sanitary committee of that club, especially the chairman, Dr. C. D. Selby, whose interest in public health affairs, fund of knowledge of the subject, and affiliations made his cooperation particularly valuable.

ADMINISTRATION AND ORGANIZATION.

The city health organization is under the administration of a board of health which appoints a health officer as its executive officer. The board, together with its powers and duties, is provided for by statute.

Membership of the board.—The board of health consists of five members appointed by the mayor. No special qualifications are necessary. The mayor by virtue of his office is president, but the board

¹ Reprint from the Public Health Reports, vol. 30, No. 26, June 25, 1915.

is authorized to elect a president pro tempore to act in the absence of the mayor.

Term of office of members.—Members of the board are appointed for a term of five years, a term expiring and a new member being appointed each year.

Meetings of the board.—The board meets regularly once a month and as much oftener as is necessary to transact business. Provision is made for special meetings at the call of the president, or of three of its members.

Salary and expenses of members.—Members of the board receive no salary.

Powers and duties.—The board of health is given the authority by statute to promulgate regulations for its own government and for the control of disease and the betterment of the public health. Regulations intended for the general public when “adopted, advertised, recorded, and certified” as are ordinances of municipalities, must be recognized by the courts as having the same force as ordinances adopted by the council. For violation of any such regulation there is provided a fine of not to exceed \$100 or imprisonment not to exceed 90 days, or both.

The board must appoint a health officer, but no special qualifications for the position are specified in the statute.

The board may appoint a clerk to have general charge of the records and reports and the proceedings of the board.

With the consent of the council the board may also appoint “ward physicians” and as many persons for sanitary duty as may be required. These latter employees have general police powers and are designated “sanitary police.” All appointments are made according to civil service regulations.

The board is given exclusive control over its employees. It may define their duties and fix their salaries, and they serve during the board’s pleasure.

The board is further given authority by statute to employ guards to maintain quarantine; to appoint a local registrar under civil-service regulations; to abate “nuisances”; to regulate the location, construction, and repair of “yards, pens, and stables,” and the use, emptying, and cleaning thereof as well as of water closets, privies, cesspools, sinks, plumbing, drains, etc., or where plumbing and sewerage are feasible and necessary but neglected or “refused” in any building, the board may take the necessary action to require correction or may correct the condition, in which event the cost must be assessed against the property; and to abate all nuisances or correct all conditions detrimental to health or well being, found on school property, by serving notice on the board of education. A

fine is provided for failure to comply with an order, and authority is given to the board of health to employ inspectors of schools and school buildings to maintain sanitary conditions.

The board of health may impose a quarantine on vehicles of common carriers when necessary, and may make rules and regulations to restrict communicable diseases disseminated by persons traveling in such vehicles. It is also empowered to investigate houses or localities in which communicable disease is suspected to exist; to quarantine at home or in a suitable place cases of quarantinable diseases; to placard houses containing certain diseases; to disinfect after communicable diseases; to destroy infected articles or buildings under certain conditions; to provide everything necessary to persons in quarantine, the expense so incurred, except for those measures imposed strictly for the protection of the public health, to be borne by the individual quarantined, if able to pay, and if not, by the municipality; to take measures, supply agents, and afford inducements and facilities for gratuitous vaccination; to close schools and prevent public gatherings during epidemics, threatened epidemics, or when a dangerous communicable disease is unusually prevalent; to maintain health supervision of schools or to cooperate with the school board in maintaining such supervision; to appoint inspectors for maintaining the purity of foods and to carry out the provisions of laws or ordinances relating to foods; to inspect maternity boarding houses and lying-in hospitals; to make to the State the necessary reports relating to morbidity and mortality or any special reports required, and to make to the State board of health and the municipal council an annual report on or before the 15th of January.

On the 1st of January, 1916, a radical change will be made in the organization and the methods of administration of the city government, for a new charter, recently adopted, will go into effect. Under this charter the mayor, vice mayor, and councilmen (one for each ward) are elected and the heads of the departments of the city government (of which there are six) are appointed by the mayor. The division of health is made a subdivision of the department of public welfare and is in charge of a commissioner of health, who is appointed by the director of the department. The qualifications required of the commissioner of health are that he be "a person eligible for admission to practice or in practice as a physician and surgeon under the laws of Ohio."

Under the direction and control of the director of public welfare the commissioner of health is required to enforce the ordinances and laws relating to the public health and is given the powers provided by statute to be exercised in municipalities by health officers.

Personnel.—At present the personnel of the health department, exclusive of the board of health, and their respective salaries, are as follows:

| | |
|--|--------------|
| 1 health officer (part time)..... | \$1,800 |
| 1 medical inspector..... | 2,000 |
| 1 chemist..... | 2,000 |
| 1 clerk to board of health..... | 1,130 |
| 1 secretary to health officer..... | 1,000 |
| 1 sergeant of sanitary police..... | 990 |
| 16 sanitary police, at \$900..... | 14,400 |
| 1 dairy and food inspector (a veterinarian)..... | 1,800 |
| 4 food inspectors, at \$1,000..... | 4,000 |
| 1 milk inspector..... | 1,000 |
| 1 restaurant inspector..... | 1,000 |
| 3 child-welfare nurses, at \$900..... | 2,700 |
| <hr/> 32 | <hr/> 33,820 |

During the first three months of this study the position of health officer was vacant, but it was filled, April 1, 1915, by the appointment of Dr. D. W. Iford, a former member of the board of health.

Office hours.—The office is open every week day from 7.30 a. m. until 5 p. m. and on Sundays and holidays from 9 a. m. until 12 o'clock noon.

The inspectors and sanitary police work from 8 a. m. until 5 p. m. except on Saturdays, Sundays, and holidays. On Saturdays work stops at noon. There are, however, two of the sanitary police on duty Saturday afternoons, Sundays, and holidays to attend to any emergency work that may arise.

The laboratory is open during the same hours as the office, and any necessary work is performed on Sundays and holidays.

Sufficient time is allowed for lunch. An annual vacation of 2 weeks is granted to each office employee, and 10 days to each member of the field force.

Transportation.—The health department owns and maintains a two-passenger automobile for the use of the chief dairy and food inspector, and one two-horse ambulance, used for conveying smallpox patients to the isolation hospital. The sergeant of the sanitary police acts as driver of this vehicle. The sanitary police, in uniform, travel free on street cars, while other inspectors and nurses are furnished with street-car tickets.

The automobile cost the department \$458.15 and its maintenance for 300 working days amounted to \$295.95, or approximately \$1 per day. This is equivalent to the amount that was previously paid for the use of a horse and buggy. By comparison, however, the automobile is by far the more economical form of transportation because of the much greater amount of work that can be accomplished in a day. Each dairy inspector should be supplied, therefore, with an inexpensive runabout.

Discussion.

It is difficult to believe that the interests of public health will be advanced under the new charter. The board of health, which has independent powers, is abolished and the authority to make regulations is vested in the council. The health officer is made subordinate in the control of the policies and expenditures for the betterment of public health. The division of health is placed on a par, for instance, with the division of cemeteries and the division of playgrounds, whereas if a health organization were permitted to carry on all of its important and legitimate activities, it would form a department of a city government as large as or even larger than any other.

That the framers of the charter apparently had a misconception of the duties of a health department is shown by the fact that the management of municipal hospitals, which includes the isolation hospital and free dispensaries, such as child welfare and antituberculosis dispensaries, is placed not in the health department but in a division of the department of public welfare, known as the division of charities and corrections. The health department should be unhampered in its efforts to control the preventable diseases and therefore the isolation hospital and the child welfare and antituberculosis dispensaries should be directly under the management of the health officer and all officials employed in the work should be under his immediate direction.

Furthermore, it is made a duty of the commissioner of charities and corrections to provide for the study of and research into causes of disease, and, by means of lectures, exhibits and in other proper ways, to promote the education and understanding of the community in those matters which concern the public health and welfare. Certainly research into the cause of disease and education along the lines of public health are among the duties of a health department.

So many important public health functions are placed in the division of charities and corrections that the division of health will virtually become a division for the correction of nuisances.

Fortunately, a wise provision of the charter permits the council to determine, combine, and distribute the functions and duties of divisions, and it is anticipated that this body will take the necessary action to place the duties before mentioned in the health department, where they properly belong.

In the charter no mention is made of the necessary qualifications for the health officer. In consequence the position may be filled on account of political considerations and not because of the ability of the appointee.

The present board of health has authority which, if it had been exercised energetically and wisely, with moral and financial assistance from the council, and the employment of a capable health officer, an

epidemiologist, more nurses and fewer sanitary police, would have resulted in Toledo having to-day a small but efficient health department capable of meeting squarely many of the existing problems in need of solution.

EPIDEMIOLOGICAL ACTIVITIES.

Morbidity Reports.

The requirements relating to the reporting of diseases are based on State law and regulations of the State Board of Health, which at the 1914 October meeting were revised to conform to the provisions of the Model Law for Morbidity Reports.

Methods of procedure.—Physicians have been reporting by telephone cases of the notifiable diseases occurring in their practice. The information thus obtained is entered on a card containing spaces for the date reported, whether a new or recovered case, the name of the disease, address, name of family, and by whom reported. The physician has been required to confirm the telephone report by a written report on a postal card furnished for the purpose by the board of health. This procedure has been frequently neglected by physicians. Heretofore semimonthly summaries of the number of cases of the several diseases reported have been sent to the State Board of Health.

The new regulations require that physicians report immediately cases of the notifiable diseases on a regular form furnished for the purpose. The reports received at the city health department on these forms are transmitted to the State department of health at weekly intervals or oftener, after a transcript has been made for the files of the local health department.

The Control of Disease.

Requirements of law.—In addition to the laws that have already been summarized in connection with the powers and duties of the board of health, a statute relating to the control of rabies is summarized as follows:

A dog which chases, worries, injures, or kills certain animals or persons may be killed, and if while it is running at large a person wounds it only he is exempt from prosecution under the penal laws which punish cruelty to animals. The owner or harbinger of the dog is liable to the person damaged for the injury done.

The court before which the recovery is had for such injury may declare the dog a common nuisance and order it killed.

A person who has been bitten by a rabid animal and it has been necessary for him to employ medical or surgical aid or otherwise to expend money, is entitled to receive reimbursement from the county in an amount not to exceed \$500.

Requirements of ordinances.—In addition to statutes which give to the local board of health certain well-defined powers and duties,

the city council has enacted a few ordinances bearing on the control of disease. Those of any importance are summarized as follows:

Members of the board of health and representatives of the board are given authority at all times to enter any lot, building, stall, vessel, etc., in the discharge of their duties, after the object of their visit has been stated to the person in control of the place.

The board of health has the authority, when it is not expedient to send a case of smallpox, varioloid, cholera, diphtheria, or scarlet fever to a pesthouse, to confine the case in a dwelling and placard the same.

Public funerals of persons who have died of smallpox are prohibited.

Public funerals of persons who have died of scarlet fever, diphtheria, or other dangerous contagious or pestilential disease are prohibited, unless the body is placed in a hermetically sealed casket.

For violation of the above ordinances there is provided a fine of not more than \$50 or less than \$5.

Spitting on the sidewalks or in any theater or other public building or in any street car is prohibited. For violation there is provided a fine of not less than \$1 nor more than \$10 for each offense.

Requirements of regulations.—Regulations of the local board of health prohibit the use of the common towel and common drinking cup in cars, vessels, vehicles, or conveyances operated by common carriers within the State, or in any school, church, hospital, workshop, factory, hotel, etc., etc.

Methods of procedure.—The card on which the report of a case of notifiable disease is noted is placed in a "daily reminder" file until the quarantine of the case, if any, has terminated. The information contained on this card is given to the sanitary policeman from whose district the disease is reported. He investigates and submits a report on a regular form which is in the nature of a very incomplete and inaccurate epidemiological study. The information obtained is not by any means conclusive and the few questions asked are the same for all diseases. It is, in fact, not to be expected that a person with the knowledge and training of the sanitary police would be capable of making the complete epidemiological study necessary to scientifically control any disease. It is also the duty of the sanitary police to placard the house and to disinfect when necessary.

All cases of smallpox and all cases of chicken-pox in adults are seen by the medical inspector. Cases of diphtheria may also be visited by him and cultures taken for diagnosis, provided the attending physician has sent no culture to the laboratory for examination or has examined none in his own laboratory. One negative culture for the release of quarantine is required. No cultures from contacts are taken. The medical inspector also sees those cases of communicable diseases in which a difference of opinion has occurred over the diagnosis.

Certain notices relating to the occurrence of communicable diseases are sent out from the office of the health department. For instance, the school authorities are notified in the case of diphtheria, scarlet fever, measles, and chicken-pox. When library books are found in

the household, the public library is notified in the case of smallpox, diphtheria, and scarlet fever. It is understood that such books may not be returned, but if returned they are destroyed. This applies to school books as well.

Diphtheria, scarlet fever, and smallpox are required to be quarantined, and when such quarantine is imposed, notice is sent to the family in quarantine stating the fact and any privileges that they may be entitled to. This refers especially to breadwinners. The breadwinner in a household under quarantine for diphtheria or scarlet fever may be given permission to carry on his business provided he does not return to the house and that he complies with certain other requirements. If it is deemed advisable, permission is given on a special form to a person to enter quarantined premises to do necessary errands.

When a patient is released from quarantine he receives a card which is authority to return to school or work.

Circulars of information relating to the cause and prevention of typhoid fever, diphtheria, or membranous croup, and scarlet fever, published by the State board of health, are sent by the local board of health to every household in which a case of the disease has been reported.

Disinfection.—Terminal disinfection of the house is practiced after diphtheria, scarlet fever, and smallpox; of the room after measles and chickenpox; and upon request after typhoid fever, tuberculosis, and erysipelas.

The time for disinfection is left to the attending physician and is coincident with the date of finding a negative culture, or with the disappearance of desquamation or scaling.

The disinfectant used is paraformaldehyde contained in a tin box with lamp attachment. The operation is performed by the sanitary police, directions being left with the family to open the house or room after a period of five hours' exposure to the gas.

The isolation hospital.—This hospital is located about a mile beyond the city limits and is under the control of the department of safety.

It is built of brick and contains two wards, each accommodating 16 patients and each with its toilet, bath, separate exit, and a small compartment formerly used for fumigating clothes of patients before departure from the hospital.

A front wing contains six smaller rooms, one of which is used as quarters for the nurse, one as a kitchen, and one as a dining room, three being utilized as private rooms for patients. There has recently been constructed a rear wing, not quite ready for occupancy, which will be used as a kitchen and dining room, thus making avail-

able as a dressing room and a private room the two rooms in the front wing now devoted to kitchen and dining room purposes.

In a separate frame building is a boiler which furnishes steam for heating the hospital and for use in a sterilizer for clothes and bedding. It also furnishes power to operate an electric generator for lighting the buildings.

The radiators in the wards are located in the floor in relation to a fresh air intake, thus furnishing heated fresh air in the rooms.

Water is obtained from an artesian well and supplied to the buildings, under pressure, by means of a gasoline engine and elevated tank.

Smallpox only is treated at the institution.

Diagnostic Laboratory.

The medical inspector is also bacteriologist of the health department. Since February 1 of the present year he has had an increase of salary from \$1,200 to \$2,000 a year and in the future will be expected to devote his entire time during the day to official work.

The laboratory is in one of four rooms occupied by the health department. It is in no way adapted to the purpose, its windows opening on a narrow court, making it necessary to use artificial light at all times, even on days when the sun is shining brightly.

This room is used jointly by the chemist and bacteriologist, whereas it is not any too large for either a chemical or a bacteriological laboratory, and it is inadequately ventilated.

The work done by the bacteriologist consists in the occasional examination of cultures for the diagnosis of diphtheria, the examination of well waters for contamination, examination of milk samples three times a week, and rarely a sputum examination for tuberculosis.

The equipment is probably sufficient for the amount of work performed.

Discussion.

A study of the morbidity and mortality reports filed with the city board of health indicates that there are undoubtedly many cases of notifiable diseases not being reported. In the case of typhoid fever, for instance, there were reported in 1914, 294 cases, with 67 deaths. According to the reports on file, there were six cases brought into the city, all of which ended fatally. Subtracting these from the total cases there would be left 288 cases with 61 deaths, being a case fatality rate of approximately 21 per cent. Such a high percentage of deaths does not actually occur. It is probable that the rate did not differ materially from that of typhoid fever elsewhere, and that in all likelihood about 1,000 cases of the disease occurred in the

city during that year. A careful epidemiological study would have brought to light many unreported cases and have secured other important data necessary for prevention.

The same remarks might be made concerning diphtheria. There were reported during 1914, 312 cases of the disease with 33 deaths, giving a case fatality rate of about 10 per cent. This is too high, and means that there were many unreported cases during that period, or that there was a failure to use, or a delay in the use of, antitoxin. This might be excusable in rural districts, but certainly not in urban communities. It should be stated here that antitoxin is furnished free of charge to indigent cases both as a curative and prophylactic agent. The expense for the same is borne by the county.

In case of measles, there were reported 921 cases with 7 deaths, or 1 death for every 131 cases. This would indicate that there were about twice as many cases of measles occurring as were reported.

Of the more familiar notifiable diseases, scarlet fever and smallpox seem to have been best reported, there having been notified 223 cases of scarlet fever with but 2 deaths and 474 cases of smallpox with 1 death. This last case had practically recovered from smallpox, and death was due to a previously existing cardiac trouble.

In 1914 there were also reported 452 cases of tuberculosis with 326 deaths. Obviously, many cases of

tuberculosis were not reported. Many of the reported cases were notified by officials of the Thalian Society. It is evident that many of the practicing physicians of the city are paying too little attention to the requirements in respect to reporting this disease as well as other notifiable diseases.

Proper epidemiological studies have not been carried on at any time and the methods pursued for the control of the preventable diseases are on the whole not up to date.

Typhoid fever.—Take, for instance, typhoid fever, a disease which is entirely too prevalent for a city as progressive as Toledo.

In December, 1910, the filter plant was finished and filtered water furnished for domestic purposes. A glance at the accompanying diagrams (Figs. 1 and 2) will show that this procedure had little influence on the incidence of the disease, although during the year immediately following the use of filtered water there were comparatively few deaths from typhoid fever. This, however, seems to have

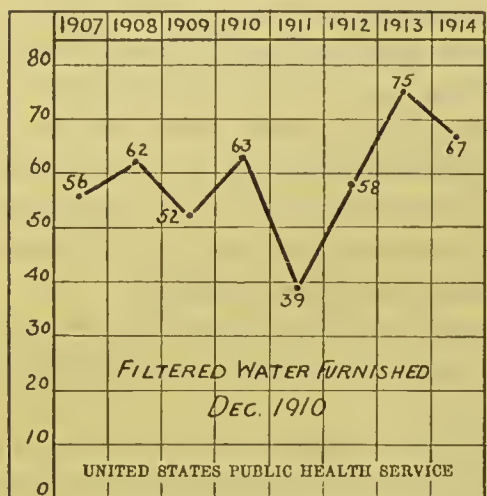


FIG. 1.—Reported deaths by years. Typhoid fever.

been a coincidence, as since that year the previous rate has been maintained, in fact exceeded, there having been 75 deaths in 1913 and 67 in 1914, while previous to filtration the maximum number of deaths per annum since 1905 was 63, in 1910. It might justly be inferred from the above that the city water supply has never been an important factor in the causation of typhoid fever.

Although there never has been attempted any real work for the purpose of tracing the origin of the many different cases of typhoid fever, the charge has been made that the shallow wells (of which there are many in the city) are the cause, and that the disease can never be eradicated until these wells are eliminated. This may be true, but it would perhaps be more consistent to say that the surface well is only one of numerous causes for the continuance of the infection.

Surface wells are bad mainly because of their insanitary environment. The map shows the location of the reported cases of typhoid fever for 1914. In a general way the cases of typhoid fever are grouped in two large areas of the city, where many surface wells are also found. It must be pointed out, however, that in these sections the

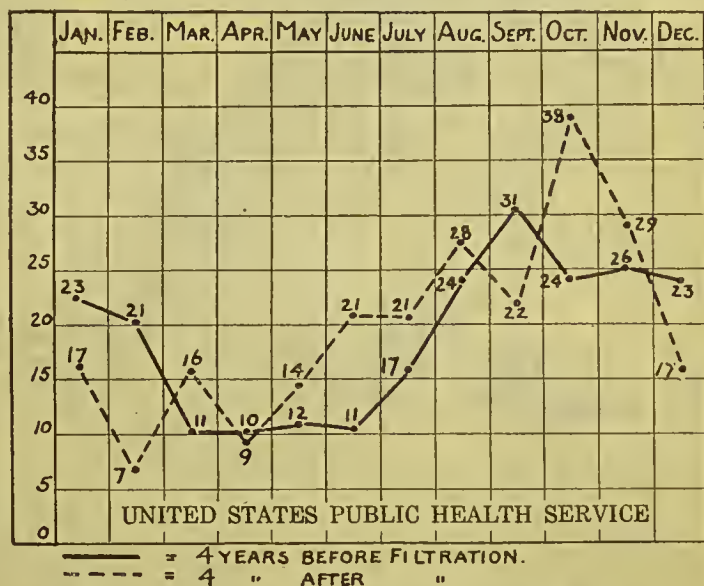


FIG. 2.—Reported deaths from typhoid fever 4 years before and 4 years after filtration.

sanitary conditions are generally bad, the insanitary privy is common, and the population not the most enlightened in public health matters.

The epidemiological records of typhoid fever give information on but four points of any importance, namely, the name and address of patient, the name of the milk dealer furnishing milk to the house where the patient is confined, and the source of the water supply used in that house. No history of the case, from the epidemiologic standpoint, is obtained by the health department during the important period of the disease—that is, the 15 days preceding the onset of symptoms. Such records as exist would appear to emphasize the fact that, while shallow wells are a factor, there are other factors of greater prominence contributing to the continuance of the disease in the city. Based on analogy with other cities and inspections of the several areas of the city, it can be assumed that there are many conditions present to account for the spread of typhoid fever.

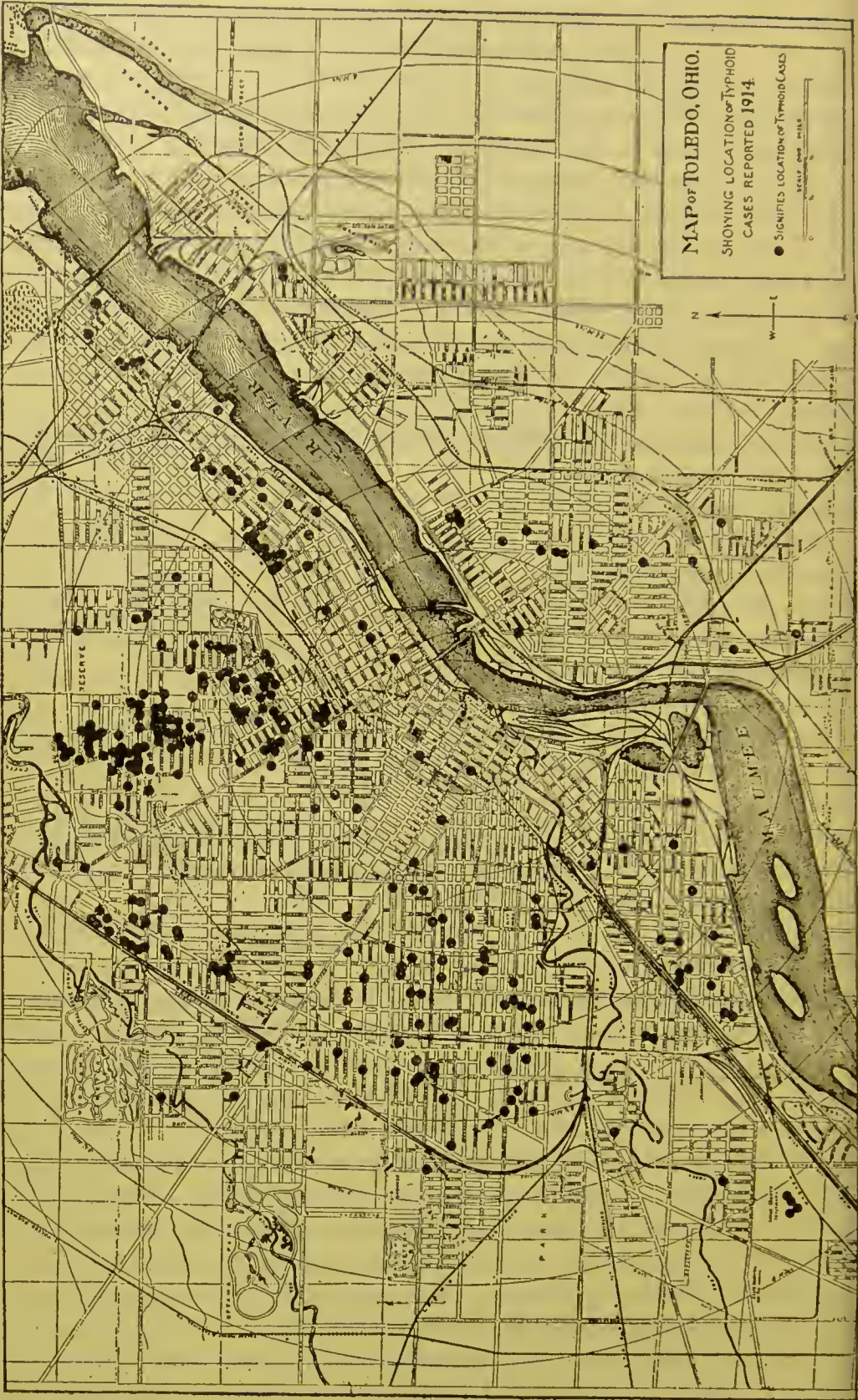


Figure 3 shows the deaths from typhoid fever by months for 10-year period 1905-1915. It will be seen that from January to April there is a decline in the deaths from typhoid fever, but that from May on there is a steady rise, which reaches its height in October—that is, as the weather becomes warmer and flies increase in numbers the deaths from typhoid fever also increase, to decline only upon the appearance of cold weather. There is, however, no month in the year in which the city does not have an inordinately high death rate from the disease.

Now, if the fly be given the opportunity to come in contact with excreta from a case of typhoid fever there exists a very common means of spreading the disease. This state of affairs exists in Toledo, for at a certain season of the year flies are numerous there, and there are many surface privies, especially in the two areas where typhoid fever seems most prevalent.

Special emphasis must be laid on the view that direct contact may play a large part in the continuation of the disease. Practically no effort is made to supervise the carrying out of prophylactic meas-

ures, either in this or any of the other communicable diseases, except, perhaps, smallpox, and there should be a well-organized corps of visiting nurses for this purpose. The nurses of the District Nurse Association, an organization supported by private philanthropy, take care of a good many patients suffering from typhoid fever as part of their routine work, but they do not see them all. In fact, there are a large number that no one sees, and until prophylactic measures can be taken in all cases little progress will be made. For this reason it is most important that an epidemiologist discover every unrecognized, concealed, or unreported case and determine the source of the infec-



FIG. 3.—Typhoid fever.—Reported deaths by months—8 years, 1907-1915.

tion in each case, whether it be from water, milk, flies, contact, or imported into the city. It would seem advisable or even necessary to take certain steps, immediately, to eradicate the disease. These should include the employment of trained epidemiologists and competent nurses; the closure of all surface privies and the requirement that all houses connect with the sewer and with the city water supply; the eradication of all fly-breeding centers by proper collection and disposal of manure or garbage, together with an active fly-swatting campaign; the issuance of prophylactic packages free of charge by the health department as well as furnishing free of charge antityphoid vaccine; and the elimination of surface wells because they are liable to become contaminated, and have no place in urban communities which have gone to the expense of furnishing pure water supplies under pressure. The sewers and water mains should be made available to all the people without delay. In addition, the milk supply of the city should be pasteurized under official supervision.

Smallpox and vaccination.—This subject is covered by both statutes and ordinances, which are summarized as follows:

Requirements of law.—The board of health may take measures and supply agents and afford inducements and facilities for gratuitous vaccination.

The board of education may make and enforce rules and regulations to secure the vaccination of and prevent the spread of smallpox among the pupils attending or eligible to attend the schools of the district. The board of health upon the application of the board of education must provide, at public expense, the means of vaccination.

Requirements of ordinances.—It is the duty of all parents or guardians to have minors under their control promptly, frequently and effectively vaccinated, so that they may not take, or be liable to take, smallpox. Such vaccination must be performed free of charge to those unable to pay. The admission of a pupil to any public or private school is prohibited unless such pupil has been vaccinated within the preceding five years or has had smallpox.

Every pupil must present a certificate of vaccination from a physician, or other satisfactory proof that the ordinance has been complied with.

The last two ordinances presumably should be enforced by the local board of education, but actually little or no attention is and has been paid to them. The attorney general for the State has ruled that when smallpox is "unduly prevalent" the board of health may require compulsory vaccination of school children.

During the year 1913 there were 310 cases and in 1914, 474 cases of smallpox reported to the board of health.

Certain persons opposed to vaccination wished to limit the action of the board of health to the imposition of the quarantine of contacts for 17 days after disinfection, instead of vaccination of contacts with quarantine as an alternative in case vaccination was refused, and argued that this procedure was required by law.

This view was upheld by the city solicitor, who ruled that according to the statute quarantine must be imposed, and the health officer had

no discretion in the matter. This is obviously wrong, as the law uses the expression "where other inmates of such house [where a patient is undergoing quarantine] have been exposed to and are liable to become ill of any such disease [they must be quarantined], for a period thereafter counting from the completion of disinfection, as follows: * * * in smallpox, 17 days; * * *." It is clear that although a person be exposed to smallpox he may not be liable to become ill—as, for instance, if he be vaccinated, in which case quarantine is not mandatory. The legal opinion resulted in the city having to go to the unnecessary expense of employing guards to maintain the quarantine of contacts, as well as of furnishing food to contacts, an expense amounting to about \$14,298.47.

The modern method of combating outbreaks of smallpox is to isolate the patient and to vaccinate the contacts, or to quarantine contacts in lieu of vaccination.

Tuberculosis.—The antituberculosis work is performed by the Thalian Society, and will therefore be discussed later under that heading.

Diphtheria and scarlet fever.—Diphtheria also has not been handled in a scientific manner. No epidemiological studies have been made, and it is only recently that the laboratory has been utilized to determine the period of release from quarantine. No effort is made to detect carriers among the contacts in the home or the school.

The State law provides that in case of diphtheria the house must be placarded and quarantined and that nobody may leave without the written permission of the board of health, and that inmates exposed to infection and liable to become ill must be quarantined for a period of 14 days after disinfection. This period of detention would seem to be mandatory only when contacts are liable to become ill. Whether they may or may not be so liable would be logically left to the discretion of the board of health, which should base its decision upon cultural findings.

In practice it has been customary to hold the patient and all contacts who are children the full 14 days, and until recently no throat and nose cultures have been taken from patient or contacts. The time for disinfection has been determined wholly upon the statement of the attending physician.

The time for disinfection in scarlet fever is based upon the termination of desquamation and is fixed by the attending physician. The board of health has made it a rule, however, never to disinfect earlier than 10 days from the date on which the house was placarded. Health officers now agree that every case of common communicable disease has its origin in a previously existing case or an apparently healthy person harboring the causative organism. In order to prevent the spread of disease therefore the case or carrier must

be isolated, thus removing the focus of infection and the isolation hospital becomes one of the most important features of a health department.

The isolation hospital in Toledo, now being used for smallpox only, should be enlarged so that cases of diphtheria, scarlet fever, typhoid fever, and measles could be properly isolated. Additional buildings are needed to isolate all open cases of tuberculosis for it is only by compulsory isolation that any marked reduction will be made in the number of cases and deaths from this disease. An isolation hospital as contemplated above should have not less than 400 beds.

In order to make the laboratory of utility to the health department and the community, its scope should be enlarged, better quarters and equipment should be furnished and a bacteriologist employed to devote his entire time to the work.

Opportunities should be offered to the physicians to have Widal tests and blood cultures made, to have sputum examined and Wasserman reactions determined, and to have other laboratory work performed to facilitate the early diagnosis of communicable diseases. Two negative release cultures from the nose and throat of diphtheria patients should be required, closer check should be kept on the bacterial content of the milk supply, and more samples from surface wells should be examined. Facilities should also be provided for carrying on original investigations into the causes of diseases and health problems of interest to the locality.

When practicing physicians are assured that material sent to the laboratory will be examined promptly and accurately, they will no doubt, in the interests of their patients, avail themselves of the opportunities offered.

It has been suggested that the University of Toledo, which is in the position to raise the necessary funds, establish a laboratory which may be used in common by the board of health and the university. This university is a young, enterprising institution, supported by the municipality. The suggestion would seem to be a good one, as it would obviate the necessity of duplicating equipment and space and would by cooperation make available to the university the practical laboratory workers of the health department for teaching purposes. However, it must be pointed out with special emphasis, if such an arrangement should be agreed upon, that the chemist and the bacteriologist doing health-department work must be absolutely under the control of the health officer and should receive their pay from the health department. A division of authority is not conducive to efficient work.

Tabulation of regulations for the control of the common communicable diseases as enforced in Toledo, Ohio.

| Disease. | Period of quarantine patient and contacts. | Placarding. | Terminal disinfection. | Treatment of breadwinners. | Excluded from school and public gatherings. |
|--------------------------------|--|-------------|------------------------|--|---|
| Diphtheria (membranous croup). | After 1 negative culture. | Yes..... | Yes; of house.. | May be permitted to carry on occupation. | Yes; patient and contacts. |
| Scarlet fever..... | 10 days after disinfection. | Yes..... | Yes; of house.. | Same..... | Same. |
| Smallpox..... | 17 days after disinfection. Patient is usually isolated in the isolation hospital. | Yes..... | Yes; of house.. | Same..... | Same. |
| Measles..... | Patient and children until desquamation has ceased. | Yes..... | Yes; of room.. | ..... | Same. |
| Chicken-pox..... |do..... | Yes..... | Yes; of room.. | ..... | Same. |
| Typhoid fever..... | No quarantine.... | No..... | Upon request. | ..... | Patient only. |
| Whooping cough.. | For patient only until recovery. | Yes..... | No..... | ..... | Patient only. |
| Tuberculosis..... | No quarantine.... | No..... | Upon request. | ..... | May be excluded. |

| Disease. | Notice of quarantine sent to family. | Public library notified. | Circulars of information. | To be reported by physician. | Disposal of dead bodies. | Remarks. |
|--------------------------------|--------------------------------------|--------------------------|---------------------------|------------------------------|--|--|
| Diphtheria (membranous croup). | Yes..... | Yes..... | Yes..... | Yes..... | Within 24 hours. No public funeral. | One culture taken for release. None from contacts. |
| Scarlet fever..... | Yes..... | Yes..... | Yes..... | Yes..... | Same..... | Disinfection after disappearance of desquamation. |
| Smallpox..... | Yes..... | Yes..... | No..... | Yes..... | Same..... | Disinfection after all scabs have disappeared. Contacts may be released upon successful vaccination. |
| Measles..... | Yes..... | No..... | No..... | Yes..... | Same..... | Disinfection after scaling has ceased. |
| Chicken-pox..... | Yes..... | No..... | No..... | Yes..... | No children are permitted to attend funeral. | Chicken-pox in adults seen by medical inspector. |
| Typhoid fever..... | No..... | No..... | Yes..... | Yes..... | No restriction..... | No supervision by board of health. |
| Whooping cough.. | No..... | No..... | No..... | Yes..... |do..... | Recovery based on disappearance of whoop. |
| Tuberculosis..... | No..... | No..... | No..... | Yes..... |do..... | No supervision by board of health. |

The determination as to when the place is ready for disinfection is left mainly to the attending physician.

MUNICIPAL ENGINEERING ACTIVITIES.

Under this heading will be considered the subjects of sewage disposal, water supply, disposal of garbage and rubbish, and street cleaning. These activities are so intimately concerned with the public health, and therefore with public health engineering, that they might logically be carried on in a division of engineering of a well-organized health department. In Toledo, however, they have become a function of the department of service.

Disposal of Sewage.

The sewers of Toledo empty their contents into three streams, namely, the Maumee River, Ten Mile Creek, and Swan Creek. Ten Mile Creek empties into Maumee Bay, while Swan Creek has its outlet into the Maumee River. The two creeks receive about 50 per cent of Toledo's sewage, or about 9,800,000 gallons daily. It is certain that they are too small to receive this amount of sewage without thereby creating a nuisance. In fact, they become at low-water periods merely open sewers, and it would be advisable to discontinue their use as channels for conveying waste products.

The highest sewer outlet of any magnitude discharging into the Maumee River is located about $3\frac{1}{2}$ miles below the intake of the water supply. Between this sewer outlet and the intake are several smaller sewers, including one carrying waste products from the water purification plant. It is said that under certain conditions of wind the water in the river will back up, thus carrying some of the city's sewage to the intake. The purification plant, however, even in such emergencies, seems to be well able to take care of the situation as far as the public health is concerned.

Anticipating the undesirable, or even dangerous, situation that may eventually occur if the present method of sewerage disposal continues, the State board of health has devised a system of intercepting sewers for conveying the sewage from Toledo, Maumee, and Perrysburg, the two latter being small towns located on the river just above Toledo. Included in this plan is a sewage purification plant, which will undoubtedly be necessary.

Sewerage system.—There are at present in the city 260.47 miles of sewers. Except in certain outlying districts and a few instances in the more congested residential portions, the city is fairly well laid with both main and lateral sewers.

A statement to the effect that most of the buildings in the city have sewer connections while in a way correct, would, nevertheless, be very misleading. It is true that all new buildings are provided with modern plumbing fixtures properly connected to the sewer, but the system in use in many of the older houses in the less pretentious residential districts is such that the good results to be expected from sewer connections are nullified by serious defects in the system itself.

The diagram (fig. 4) explains this system better than words. It will be noted that the cesspool or "catch basin," as it is called locally, is a poor imitation of an uncovered septic tank. Built over the opening is a poorly constructed privy, permitting free access of flies to the fecal matter below. One side of the cesspool is connected to the sewer. Into the other side empties the house drain, which does not carry sewage, but which is connected with the cellar and the overflow

from the cistern and the slop sink located outside of the house, the idea being that an accumulation of water in the cellar, an excess of water in the cistern, and all waste water will, on its way to the sewer, flow through the cesspool and thus act as a flush.

Often the outlet of the cesspool becomes plugged, the cesspool fills up, its contents back up into the house drain and cellar, and by reason of poorly laid drain pipes, even into the well which is frequently in close proximity or in juxtaposition.

These cesspools are supposed to be water-tight to a level somewhat above the intake and outlet. Perhaps they are. The danger, however, lies mainly in the fecal matter being exposed to flies, and this menace is present whether the cesspool be full or operating normally. If full, there is the added danger of overflow, with surface contamination.

SYSTEM OF PLUMBING USED IN MANY HOMES IN TOLEDO, OHIO.

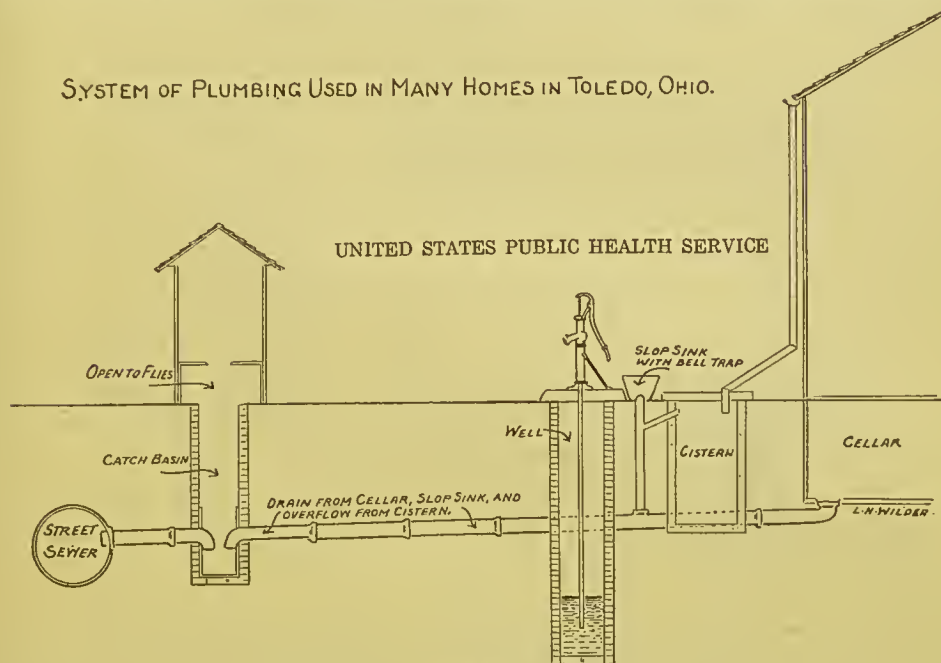


FIG. 4.

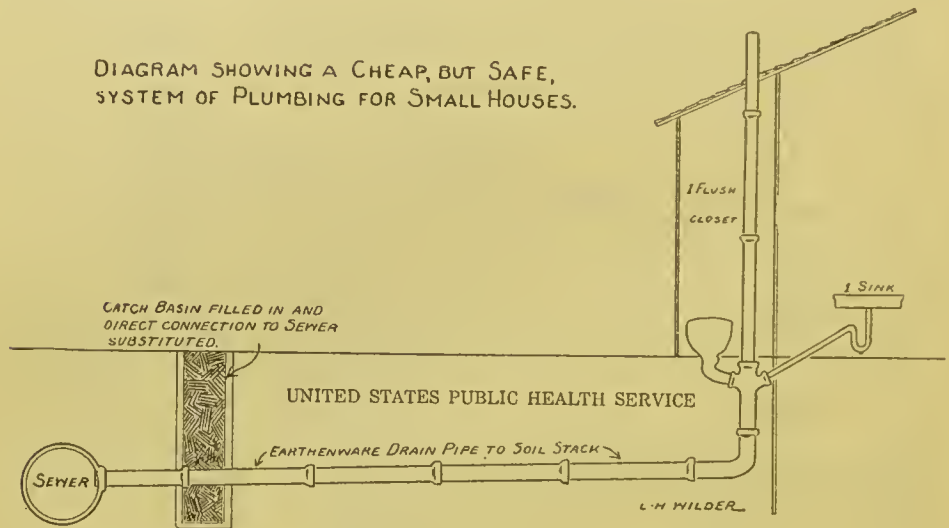
Plumbing.—The ordinances relating to plumbing are contained in the building code and enforced by the department of safety. They do not differ materially in their provisions from those adopted by other cities and as usual are so voluminous and restrictive that modern plumbing, instead of being recognized as a necessity, has become a luxury.

The officials who are interested in having human waste matter disposed of in a sanitary manner, aided and encouraged by the individuals whose business it is to install systems for such disposal, have gradually succeeded by complicated legislation in defeating the very purpose for which the enactment was intended, namely, to give to all, rich and poor alike, a clean, safe, and modern means of conveying certain waste products from the house to the street sewer.

To a certain extent the original conception of a system of modern plumbing was based on false premises; that is, that sewer gas is responsible for many ills. It is now known that sewer gas can not cause or transmit disease.

The standards that have been established are unnecessarily rigid. It has been assumed that to install a plumbing system that would prevent the spread of disease requires particularly fine workmanship, a worker of unusual ability, and materials of exceptional quality. This has been the cause of bringing about a combination of circumstances making a modern plumbing system practically prohibitive to the person in poor financial condition.

In Toledo the need for modern plumbing in many houses is imperative. The cesspool must be abolished; in fact, State law and regulation and a city ordinance prohibit them, but because of the



cost of the installation of fixtures, sewer pipes, traps, back venting, sewer connections, and the like the board of health has refrained from taking any drastic action. Such action, however, should be taken immediately, and when the householder refuses to obey the orders of the board the work should be performed by the city and the cost charged as a lien against the property. At the same time, the plumbing ordinances should be modified, making it possible to install a simple but efficient system of plumbing at reasonable cost.

Fig. 5 shows a simplified system of plumbing for small houses which will insure an adequate and safe means of carrying sewage from the house to the street sewer. It is contemplated to use standard soil pipe, a deep seal trap at sink, no brass ferrules on flanges, no back venting, earthenware pipe to soil stack, galvanized iron flashing, etc., with the idea of decreasing the cost without lessening the utility of the installation.

The Water Supply.

The municipal water supply is taken from the Maumee River about $3\frac{1}{2}$ miles above the first large sewer outlet. This river begins in the vicinity of Fort Wayne, Ind., and flows through Ohio, emptying into Lake Erie. Along its banks are located a number of prosperous communities, the largest of which are Fort Wayne at its origin and Toledo at its termination. It is therefore receiving pollution along its entire course and accumulates much organic matter and silt.

On account of the prevalence of typhoid fever in the city and the muddy condition of the drinking water it was decided to build a filtration plant. This was finished and in operation in December, 1910. Since that time the city water has been of undoubted purity as far as it affects the health of the community, and yet no effect has been had on the typhoid death rate.

The purification plant is comprised of mechanical filters supplemented by hypochlorite treatment and a pumping station operated by gas engines using producer gas.

The water is pumped from the intake to the head house or inlet well where it is mixed with alum in a proportion averaging 4.4 grains of alum to the gallon of water. The amount of alum used varies from time to time, depending upon the turbidity of the water. Thus, in April, with an average turbidity of 501 and with suspended matter averaging 201 parts per million, there was used an average of 7 grains of alum to the gallon of raw water. On the other hand, in September, with an average turbidity of 91 and 31 parts of suspended matter per million, there was used an average of but 2.8 grains of alum per gallon of raw water.

From the inlet well the water passes by gravity to the sedimentation basins, two in number, having a capacity of 5,000,000 gallons each. By an arrangement of mixing baffles the water and coagulant are thoroughly mixed and a baffle wall directs the flow from one end of the basin to the other and back before passing to the filter beds. This represents a distance of 1,000 feet and takes about 6 hours in the passage, or a sufficient time for precipitation and sedimentation to take place. These settling basins are cleaned once every month. During the year 1914, 4,033,640 pounds of mud were removed.

The filter conforms to the type of rapid sand filters. It is composed of 34 units each having a normal capacity of 1,000,000 gallons per day or a maximum capacity consistent with efficiency of one and one-third million gallons. Each unit has an area of 360 square feet. The filtering material consists of 30 inches of sand and 9 inches of gravel in 4 sizes. Each unit will operate about 60 hours before cleansing is necessary. It is then cleaned by reversing the flow of water under pressure, at the same time forcing air through from below upwards,

thus agitating the sand particles to permit of more thorough washing. The units can be cleaned rapidly.

The filtered water is treated with calcium hypochlorite in varying quantities, depending upon the amount of organic matter and color index. The average daily amount for the year 1914 was 20 pounds per million gallons, with a maximum of 25 pounds per million and a minimum of 12 pounds per million. The excessive amounts are said to be necessary because of the large quantity of organic matter and high color index. After treatment the coloration is reduced about 50 per cent.

There is a chemist in charge of the plant who keeps close check, chemical and bacteriological, on all of the operations, and determines daily the amount of chemicals necessary and the efficiency obtained.

Each day 0.01, 0.1, 1, 5, and 10 cubic centimeters of a sample of the raw water are placed in fermentation tubes of lactose broth and lactose bile. The same is done with a sample of the filtered water, except that the amounts are 0.1, 1, 5, 10, 25, and 50 cubic centimeters. The presumptive test only is taken as an indication of the presence of colon bacilli. The results of examinations of 359 samples of raw and 360 samples of filtered water during the year 1914 were as follows:

RAW WATER (359 SAMPLES).

| 0.01 c. c. | | 0.1 c. c. | | 1 c. c. | | 5 c. c. | | 10 c. c. | | 25 c. c. | | 50 c. c. | |
|------------|-------|-----------|-------|---------|-------|---------|-------|----------|-------|----------|-------|----------|-------|
| + | - | + | - | + | - | + | - | + | - | + | - | + | - |
| 23 | 336 | 182 | 177 | 308 | 51 | 359 | 0 | 359 | 0 | ..... | ..... | ..... | ..... |
| 6% | ..... | 50% | ..... | 86% | ..... | 100% | ..... | 100% | ..... | ..... | ..... | ..... | ..... |

FILTERED WATER (360 SAMPLES).

| | | | | | | | | | | | | | |
|----|-------|----|-------|----|-------|----|-------|----|-------|-----|-------|-----|-------|
| 0 | 360 | 0 | 360 | 0 | 360 | 0 | 360 | 0 | 360 | 41 | 319 | 86 | 274 |
| 0% | ..... | 0% | ..... | 0% | ..... | 0% | ..... | 0% | ..... | 12% | ..... | 24% | ..... |

Of the samples of filtered water showing the positive presumptive test in 25 cubic centimeter amounts, all were collected during the first six months of the year. During the last six months none was positive.

In addition to the daily tests for colon bacilli, bacterial counts of the raw, settled, and the filtered water are made three times a day at intervals of eight hours. The average counts by months are shown below.

1914.

| | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|-------------------------------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
| Raw water..... | 10,535 | 13,070 | 21,711 | 18,672 | 11,600 | 2,308 | 2,850 | 1,382 | 1,270 | 2,880 | 2,943 | 2,264 |
| Settled water..... | 427 | 770 | 1,078 | 137 | 344 | 134 | 405 | 219 | 307 | 480 | 324 | 23 |
| Filtered water..... | 145 | 164 | 274 | 36 | 96 | 87 | 87 | 18 | 8 | 8 | 21 | 12 |
| Percentage of efficiency..... | 98.6 | 98.7 | 98.7 | 99.9 | 99.1 | 96.2 | 96.9 | 98.7 | 99.3 | 99.7 | 99.3 | 99.4 |

The large number of bacteria in the filtered water during January, February, and March, as compared to the number present during the other months of the year is to be accounted for by the fact that in January an inadequate amount of hypochlorite was used, while in February and March that chemical was not used at all.

After filtration and treatment with hypochlorite the water passes by gravity to a pumping station where it is pumped directly into the mains. On account of the low elevation of Toledo and the surrounding country it is not possible to utilize a pressure gravity system, and there are therefore no distributing reservoirs. There are, however, two storage reservoirs, one of 5,000,000 gallons and one of 16,000,000 gallons capacity, which are kept filled by the excess of water filtered over that used by the city. These reservoirs furnish a reserve supply.

During the year 1914 there were filtered 6,931,920,000 gallons of water, of which approximately $1\frac{1}{2}$ per cent was used as wash water, and the rest, amounting to 6,791,196,000 gallons, was delivered to the city. This means a daily average of 18,606,016 gallons, or approximately 100 gallons per capita per day. It should be noted that the filter plant is not being worked to its normal capacity, for it would be able under normal conditions to furnish 100 gallons per capita per day to 340,000 people. Thus it has been designed to care for a future growth of the city.

The objectionable feature of the city water is its hardness, this averaging 260 parts per million for the year 1914 both in the raw and the treated water. Much of the hardness is due to the bicarbonates of calcium and magnesium, so that when the water is heated carbon dioxide is liberated and for a short time after being drawn from the tap the water has a milky appearance. The carbon dioxide causes more or less destructive action on galvanized-iron water pipes and hot-water tanks. The hardness is also due to the incrustants, calcium and magnesium sulphate. Because of its hardness a change in the chemical treatment of the water has been contemplated, substituting calcium oxide and ferrous sulphate for the alum. This should greatly reduce the hardness and make the water more agreeable for washing purposes. Hypochlorite will still be used, but it may be possible with the proposed change to use it in smaller quantities.

There are in use in the city a number of driven wells about 200 feet deep. These probably furnish an uncontaminated water. On the other hand, the shallow wells and cisterns, of which there are many in use in the city, because of their poor construction and insanitary environment are liable to pollution and are out of place in a progressive municipality which has gone to the expense of furnishing to its citizens a safe potable water under pressure. That the city water is hard can not be denied, but this might be remedied by a change in the treatment. That the water has at times a bad odor is equally true, but this should be easily prevented by some modification in the operation of the plant. Bad odors do not cause disease.

Collection of Garbage and Rubbish and Street Cleaning.

Requirements of ordinances.—The ordinances bearing on the subject of garbage collection and disposal are summarized as follows:

Every resident householder, tenant, hotel keeper, boarding-house keeper, wholesale and retail dealer and vender of meats, fish and fowls, fruits and vegetables, and every person occupying a dwelling in the city must provide a garbage receptacle. Such receptacle must be a portable vessel or tank of not more than 2 bushels capacity, perfectly water-tight, and provided with a tightly fitting cover which must not be removed except when necessary in the use of the receptacle. It must be placed at the rear of the house or in the basement areas or passageway most accessible for purposes of collection, but must not be placed on a street, alley, sidewalk, or other public place.

By the term garbage or offal is meant refuse accumulation of animal, fruit, or vegetable matter, liquid or otherwise, that attends the preparation, dressing, use, cooking, dealing in or storage of meats, fish, fowls, fruits, or vegetables. It is unlawful to place in garbage receptacles any refuse except garbage and offal.

The city may remove garbage or may contract to have it done. This also applies to the removal of carcasses of dead animals. No one but an authorized person may collect or transport garbage and it is unlawful for any person to dispose of any garbage except as provided for by the above ordinances.

It is unlawful to throw garbage or anything that may cause an obstruction into any catch basin, sewer, ditch, or drain, or to throw, bury, burn, or leave garbage in or upon any street, alley, vacant lot, public square, etc.

For violation of any of the provisions of the garbage ordinances there is provided a fine of not less than \$5 nor more than \$50.

Requirements of regulations.—The regulations bearing on the subject of garbage are summarized as follows:

Every resident must have a galvanized iron garbage can of not less than 10 gallons capacity, with two side handles and a close-fitting cover.

This can must be kept in the back yard near the alley fence, and must be used for nothing but pure garbage.

Where there is no alley the can must be placed at or near the back door of the house. The collector will not go indoors, upstairs, or down cellar, to empty or to return the can.

The garbage must be drained of water before being thrown into the can. This is a sanitary measure, but it also saves the resident money in winter, as it prevents the garbage freezing to the side of the can at the cost of being chopped out and the can ruined.

The can should be scalded once a week, and should be replaced as soon as it is found to be leaking.

The collector is not required to remove the garbage if he finds anything else in the can. Paper, tin cans, and all other refuse and rubbish of whatever kind must be kept in a separate receptacle.

No money or other remuneration may be given to the collector. He is paid by the city.

All complaints must be made to the street department and all dead animals must be reported to the same office. They will immediately be removed by the dead animal collector.

The street department is required to collect garbage in the residence district once a week, from large flats twice a week, and from hotels and restaurants every day.

Collection and disposal of garbage.—Garbage is collected by the city and disposed of by means of reduction. The city owns the horses and wagons and employs the men engaged in the work of collection.

Collections are made in the business section of the city from hotels and restaurants once a day, from residence districts once a week, and from flats twice a week.

In collecting garbage from hotels and restaurants the full cans are removed and empty cans which have been flushed with water substituted. From other places the contents of the can only are removed. They are first emptied into a tin basket carried by the scavengers, and then into the wagon, a procedure which goes a long way toward preserving the shape and usefulness of the garbage can.

Three types of wagons are in use. One is a truck designed to carry 12 large garbage cans. Another type has a rectangular, removable iron body with a capacity of about $2\frac{1}{2}$ tons. This is closed by a canvas cover. Another type has a horizontally placed cylindrical, removable iron body also with a capacity of $2\frac{1}{2}$ tons. One driver and a helper accompanies each wagon. Garbage wagons and teams, of which there are 28, are used exclusively for collecting garbage.

In addition to these wagons a motor truck is used capable of transporting the bodies of two wagons containing 5 tons of garbage.

To expedite the removal of garbage to the disposal plant, when the hauls are too long to permit of two trips a day per wagon, a collection station has been established at a convenient place near the business section of the city. Here the loaded bodies of the wagons are removed from the running gears by a hoisting apparatus and placed on the auto truck or on platforms awaiting such means of transportation.

The disposal plant is a commercial enterprise owned by a private company which receives from the city \$489.58 per month. Garbage must be delivered to the plant by the city. A description of the process used at the reduction plant is briefly as follows:

The body of the wagon is removed by a hoist and its contents are dumped into a cement pit. Running in a channel along the bottom of the pit is a conveyor into which the garbage is raked. As it passes along, a man removes the tin cans or other rubbish, and it is finally conveyed to iron retorts where steam is applied to effect reduction. After this process is completed the reduced garbage is subjected to pressure which forces out the excess of water and some grease. It is then taken to drying ovens where the remainder of the water is expelled by heat. The offensive gases given off during the process are condensed or burned in order to prevent a nuisance. The dried material is then placed in a specially constructed percolator where it is given three treatments with gasoline. The percolate containing the dissolved grease obtained after the first and second application of the menstruum, is distilled. The gasoline passes off to be condensed and used again. The residue is the grease which is a final product of the plant. This product should represent about 3.3 per cent by weight of the total amount of garbage treated. The gasoline

used in the third application contains the least amount of grease and is utilized before distillation as the first application in a new charge.

The tankage from which the final trace of gasoline has been expelled by heat is then perfectly dry and is drawn off, ground, and sieved, and forms the other final product of the plant. It is used in the manufacture of fertilizer. The disposal plant, according to report, has not been making money. Apparently it has been permitted to run down so that it was not possible to operate it on an economical basis and much of the grease was lost. The plant is at present being repaired and some new apparatus installed. When completed it should insure a profit on the investment.

Collection of ashes.—Ashes and other rubbish are collected only two or three times a year so that during the winter there accumulates in the alleys, unpaved streets, and lots a large collection of ashes notwithstanding an ordinance prohibiting the throwing of rubbish of this kind in such places. In the collection of rubbish it is customary to use hired wagons and teams in addition to the rubbish wagons owned by the city. It would be desirable to inaugurate a more frequent collection of rubbish instead of the present system.

Street cleaning.—Street cleaning is accomplished by means of 8 sprinkling wagons, 8 flushing wagons, 6 sweepers, and the necessary employees, including a force of "white wings" working in the business section of the city.

The flushing wagons are not operated by a gasoline pump, but are charged with air under a pressure of 70 pounds before leaving the sheds for the day's work. This serves throughout an entire working period. Flushing is usually done at night.

Housing and equipment.—The building which houses the equipment necessary to carry on the activities of the department of service contains stables for the horses and a horseshoeing shop, shops for rebuilding or repairing wagons or other rolling stock, offices, store-rooms, stock rooms, and yard space and sheds for the wagons. The property is well taken care of and the property responsibility placed in a businesslike way. Discipline among the employees seemed to be well maintained, and the horses well cared for and in good condition. The entire plant was well ordered and in a sanitary condition.

The following tabulation will indicate the activities carried on, together with the expenses incurred during the year 1914:

Garbage:

| | | |
|--------------------------------|---------|---------------------|
| Loads collected..... | 10, 507 | |
| Tons collected..... | 26, 267 | |
| Pay roll, labor..... | | \$48, 331. 28 |
| Incidentals, repairs, etc..... | | 2, 833. 34 |
| Disposal plant..... | | 5, 874. 96 |
| Garbage road repairs..... | | 1, 995. 94 |
| New equipment..... | | 11, 660. 74 |
| | | <hr/> \$70, 696. 26 |

Street cleaning:

| | | |
|---|---------------|----------------------|
| Alleys and rubbish, loads collected..... | 21, 103 | |
| Streets, loads collected..... | 18, 310 | |
| Snow, loads collected..... | 9, 701 | |
| Sweeping streets, miles..... | 612 | |
| Flushing streets, miles..... | 340 | |
| "White wings," sweeping by hand, unknown. | | |
| Pay roll, labor..... | \$78, 786. 57 | |
| Rigs, equipment and supplies..... | 12, 981. 83 | |
| Alleys and rubbish..... | 17, 726. 52 | |
| | | <hr/> \$109, 494. 92 |

Dead animals collected:

| | |
|--------------------|--------------|
| Dogs..... | 2, 909 |
| Cats..... | 1, 107 |
| Other animals..... | 126 |
| | <hr/> 4, 142 |

| | | |
|----------------------------|---------|------------------|
| Pay roll, collector..... | 720. 00 | |
| Rigs, oil and repairs..... | 413. 15 | |
| | | <hr/> 1, 133. 15 |

Comfort stations (2):

| | | |
|---------------|------------|------------------|
| Pay roll..... | 3, 106. 36 | |
| Supplies..... | 1, 243. 36 | |
| Repairs..... | 131. 58 | |
| | | <hr/> 4, 481. 30 |

Street repairs:

| | | |
|-----------------------------------|---------|-------------|
| Total amount repaired.....yards.. | 20, 081 | |
| Total cost..... | | 19, 526. 24 |

Asphalt repairs:

| | | |
|-------------------------------|---------|------------|
| Total amount laid.....yards.. | 10, 961 | |
| Total cost..... | | 9, 324. 10 |

Stone roads:

| | | |
|--------------------------------|---------|------------|
| Built and repaired.....yards.. | 12, 795 | |
| Total cost..... | | 4, 222. 35 |

Oiling roads: Total amount..... 643. 38

Sewers: Total cost of cleaning and maintaining..... 14, 240. 21

Other activities in connection with maintenance and repairs to pumps for artesian wells, Cherry Street Bridge, steam roller, turnpiking and grading, crosswalks, blacksmith shop, and street opening..... 22, 525. 77

Supervision, office expenses, etc..... 13, 461. 80

Moving and remodeling building, machinery, etc..... 6, 634. 00

Not including the expense for new equipment, it cost the city to collect 1 ton of garbage and deliver it to the reduction plant approximately \$2.02 or \$5.05 per wagonload of 2½ tons.

To dispose of 1 ton of garbage at the reduction plant cost the city 22½ cents.

Total cost of collection and disposal, \$2.24½ per ton.

Discussion.—If a sanitarian visiting Toledo should attempt to gain from the citizens an idea of the system of garbage collection he would very likely conclude there was none. Upon personal investigation he would be agreeably surprised, therefore, to learn that the city was actively engaged in garbage collection and that the system was probably as efficient as possible, taking into consideration the number of wagons and the nature of the employment.

A health department and a garbage division are in the unfortunate position of having to listen to many complaints but rarely a word of commendation. Sometimes the complaints are well founded, sometimes they are not. Not infrequently they arise from a lack of cooperation on the part of the citizen, either the complainant or his neighbor.

During the year 1914 there were collected about 26,267 tons of garbage or approximately 72 tons per day. The garbage is very wet, it being estimated that the excess of water amounts at times to as high as 20 per cent. In the summer this can be drained off into the house drain before emptying into the wagon, but in the winter it is frozen and has to be taken with the garbage.

Householders should realize that it is not to their interest to throw water into the garbage can, which causes rapid rusting, and if frozen renders the can liable to injury from the picks used by the scavengers.

It is thought that in Toledo a conservative estimate of the amount of waste products from kitchens or other similar sources would be one-half ton for every 1,000 people or about 90 tons or 20 per cent more than is being collected. The bulk of this uncollected garbage is probably to be found in the outlying parts of the city or is comprised in part of the garbage incinerated on private premises.

Except in the down-town districts the intervals between collections are certainly too long, especially during summer weather. In order to shorten them it would be necessary to increase the number of wagons, and probably it would be better to adopt a type of wagon that could be used both for garbage and ashes. It would be well to collect ashes twice a week and garbage four times a week in summer and twice a week in winter, in addition to the present daily collection from the hotels and restaurants. The entire city should be covered and collections made regularly. Steam or electric cars might be used for conveying garbage to the reduction plant, thus shortening the hauls made by wagons. Householders should be required to provide two containers, one for garbage and one for rubbish.

By reason of the bad odors produced at times, the reduction plant has been the cause of many complaints. However, the installation of washers for the gases and a gas-consuming furnace and a careful supervision over the operations of the plant make it possible to reduce the nuisance to a minimum, especially where the garbage furnished is fresh and the capacity of the plant is not overtaxed. The plant is designed to reduce 90 tons of garbage a day. A more frequent collection would result in delivering garbage in the fresh condition, and the amount delivered would be more equally divided so that overtaxing the plant's capacity would be less likely to occur.

FOOD INSPECTION.

Food inspection as carried on by the health department of Toledo will be taken up under three headings, namely, "The Control of the Milk Supply," "The Inspection of Meats and Other Foods," and the "Chemical Laboratory."

The Control of the Milk Supply.

By statute, the control of the milk supply in municipalities in Ohio is placed in the hands of the local boards of health. The State law also makes provision for the maintenance of the purity of the milk. In addition to law the city of Toledo has passed ordinances requiring certain precautions to be taken.

Requirements of laws.—The laws are summarized as follows:

The board of health may appoint, define the duties and fix salaries of, inspectors of dairies, slaughterhouses, etc., milk, meat, etc., who are given the right of entry into any house, vehicle, or yard. The board may authorize the health officer to perform the duties of such inspectors.

The board of health is required to keep a record of the name, address of residence and place of business of all persons engaged or about to engage in the sale of milk, and may issue a permit, after inspection, to sell milk. If the place is found in an insanitary condition the permit may be refused. The board may also require a certificate from a licensed veterinarian that the cows furnishing milk brought for sale within the city are free from tuberculosis or other dangerous disease.

If typhoid fever, scarlet fever, or other dangerous contagious or infectious disease occurs in the family or among the employees of the producers or venders of milk, the dairyman or vender must immediately notify the local health officer, who may order the sale of such milk stopped pending an investigation. The investigation must be made without delay and the board of health may order such steps to be taken as will prevent the sale of impure, adulterated, and unwholesome milk or milk liable to carry disease.

All dairies, including the cows, cow stables, milk houses and vessels, the owners of which offer milk, butter, or cheese for sale within the city are subject to inspection. The inspectors may enter any place where milk is sold or kept for sale and any vehicle used for the conveyance of milk within the corporate limits.

When an inspector believes that milk found in the city is impure or adulterated, he must take specimens and subject them to satisfactory tests, and, if the board of health directs, to chemical analysis. A record must be made of the results of the test and the analysis. A certificate sworn to by the analyst must be admitted as evidence in prosecution.

Milk is deemed adulterated if it contains more than 88 per cent of watery fluid or less than 12 per cent of solids or less than 3 per cent of fats.

For selling adulterated milk or milk to which a foreign substance has been added, or milk taken from diseased cows or cows fed on distillery or starch waste, or from cows kept in an insanitary place, there is provided a fine of not less than \$50 nor more than \$200 for the first offense, and not less than \$100 nor more than \$300 or imprisonment in the jail or workhouse for not less than 30 days nor more than 60 days for the second offense.

Further penalties are provided for misrepresentation as to pure milk: For the sale of skimmed milk unless properly labeled; for selling or manufacturing condensed

milk not up to the State standard, or if made from skimmed, impure, adulterated, or unwholesome milk; for selling milk which is impure, unclean, unhealthy, or unwholesome, or milk falsely labeled or branded; for keeping a cow for the production of milk in a cramped or unhealthy condition or feeding it on food which produces impure, unhealthy, or unwholesome milk; for filling or refilling milk or cream bottles without previous cleansing or sterilization.

Requirements of ordinances.—No person may sell milk or cream without a permit from the board of health. The application for a permit must be made on proper form and must contain the following information: Name, and address of residence and place of business. The dealer must thereafter notify the board of health of any change in the location of his business. The permit is issued after an inspection has shown that the stables, cows, wagons, store, and utensils are clean; that the food furnished to the cows is pure and wholesome; and that the persons handling the milk are clean and free from disease. The application must be signed by the applicant and filed in the health office and a record kept of same. The board of health may revoke the permit for cause. If applicants, or persons from whom applicants receive milk refuse permission to have their dairies or herds examined the board of health may refuse a permit. The health officer or other person designated by the board of health has the right to enter and inspect all places where milk is sold.

If dairy herds are located in Lucas County the milk inspector has the right to inspect them for the purpose of detecting the presence or absence of tuberculosis or other infectious disease. If the herds are located outside of Lucas County such examination may be made by some local person satisfactory to the board of health. The health officer or inspector is authorized to use the tuberculin test and report without delay the results to the board. All animals examined must be tagged so as to show the presence or absence of disease.

All cans containing milk or cream coming into the city must be sealed before shipment. Inspectors have the authority to open any cans or other vessels sealed or otherwise, and if the milk is found to be filthy or the cans unclean the milk or cream may be then and there condemned and poured upon the ground. A record must be kept of all milk destroyed, with a record of the analysis of the sample taken before condemnation. Also a record must be kept of all inspections made. The board of health has the right to take samples of milk or cream for analysis, not exceeding in amount 1 pint. All wagons must have painted on both sides, in letters not less than 5 inches high, the name of the vender and the permit number. Wagons selling skimmed milk must be so labeled, and all wagons from which skimmed milk is sold and all receptacles containing skimmed milk must be painted pale blue. All premises from which milk is sold must be kept clean and free from garbage and rubbish.

No person suffering from an infectious disease such as cholera, smallpox, whooping cough, typhoid fever, typhus fever, scarlet fever, or consumption, or having come in contact with such diseases is permitted to handle milk, nor can milk be sold from any place where such disease is present without a permit from the board of health.

Cows suffering from an infectious disease must be removed from the herd, and milk from such cows must not be sold. It is unlawful to sell any milk from which a whole or part of the cream is removed, except as skimmed milk. Whole milk must contain not less than 3 per cent of butter fats, 12 per cent of total solids, solids, nonfat, 9 per cent, and not more than 88 per cent of water. Cream must have not less than 18 per cent of butter fats.

Milk must not be sold if it is drawn from cows within 15 days before and 12 days after parturition, if it contains any preservative, or if it comes from diseased cows or cows fed on refuse from vinegar factories or other similar material, and persons are forbidden to have in their possession for the purpose of feeding to milch cows any refuse from a distillery or vinegar factory or other similar slops. The same applies to cream.

All milk must be properly aerated immediately after milking, and must be kept free from dirt, foreign material, and sediment. All milk after aeration and straining and when offered for sale must be at a temperature of 60° or under.

When offered for sale milk must not contain more than 500,000 bacteria per cubic centimeter, and must contain no pathogenic organisms.

No milk or cream can be sold in quantities of less than 1 gallon, except in sanitary bottles sealed with a suitable cap or stopper, and except where the milk is sold at the milk house or dairy, when it may be dipped. Such dipped milk must not be carried on any street except in a covered vessel.

No person is permitted to transfer milk from one receptacle to another on a street, alley, or on any wagon, vehicle, or in any exposed place. Milk may be so transferred only in a creamery, milk depot, or in the house of the customer.

The name of the dealer bottling the milk or cream must be indelibly and legibly indicated on the cover or cap of the bottle. For violation of the above ordinances relating to aeration, temperature, etc., there is provided a fine of not less than \$25 nor more than \$300, or imprisonment in the workhouse not to exceed six months, or both.

Methods of operation.—There are two men engaged in the supervision of the milk supply. One, a graduate veterinarian, inspects producing farms and pasteurizing and bottling plants. In addition to this he is required to inspect, before and after slaughter, all animals killed in the local slaughterhouses except those under United States Government supervision, and to examine and supervise the disposition of dogs suspected of having rabies. It is needless to point out that these duties are too many for one inspector, and inspections of farms and milk plants are necessarily limited to infrequent intervals. The other inspector devotes his time to the collection of samples.

Samples are mainly collected in the early morning from wagons, twice a week for bacteriological and three times a week for chemical examination. An unopened pint bottle is taken as a sample. It is sealed by the inspector and the data necessary for identification written on the seal. The seal is of paper and is pasted over the top and around the neck of the bottle. Samples for bacteriological examination are iced during warm weather. No samples of bulk milk are taken, but an inspection of the cans at the depots is occasionally made to determine whether they are sealed according to ordinance. If cans arrive unsealed they are tagged and returned to the shipper.

The board of health does not recognize any standard except that already mentioned. There is, however, one producing farm which, by arrangements with the local physicians, furnishes certified milk which sells for 12½ cents a quart. This farm is in Michigan and was not inspected by the author. A visit was made to other producing farms in close proximity to Toledo. The results of these inspections were very disappointing. The barns were poorly ventilated and, generally speaking, dirty. The small-top milk pail was

not used. The cows were mostly dirty, aërotors were not protected from flies, and, in fact, indications were that the farmers were lacking in the progressive spirit. Producing farms are scored once a year.

There are several plants furnishing pasteurized milk, and with one exception all use the holding method. There is, however, no uniformity as to temperature or time of holding, the temperature varying from 140 to 150 degrees and the time from 15 to 30 minutes, depending on the ideas of the person operating the plant. No thermoregulator or temperature recorder was in use at any of the plants, although it is understood that a temperature recorder has been installed at one plant since the inspection was made. The milk is always bottled by machinery, but capping, in many instances, is accomplished by hand.

Several plants were using a method for pasteurization which if operated properly should give excellent results. The raw milk is received, heated, held, cooled, agitated, and to some extent aërated in the same tank, from which it passes direct to the bottling machine. The fewer pipes and exposed surfaces the milk comes in contact with after pasteurization the less chance of contamination. The process is carried out by means of a revolving pipe or disk coil through which passes first the hot water and then water cooled by brine.

One of the plants uses paper bottles, which is a step in the right direction, but these bottles are not entirely satisfactory. The bottle is square, with a circular opening cut in its top for the mouth. It is made of thin pasteboard and is opaque. At the milk plant it is shaped into the proper form by four machines from blanks furnished by the manufacturer and finally parafined inside and out by a special apparatus. The cap is also furnished by the manufacturer, and when the bottle is filled the cap is placed in the opening by hand and then expanded by a piece of special machinery, thus making a tight stopper. A square paper bottle has many advantages over glass, both to the dealer and to the consumer, in that it is used but once and therefore is in no danger of contamination, and the annoyance of collecting bottles and breakage are avoided. It can also be packed in a smaller space and, being square, the bottles can be placed in close apposition, thus conserving a low temperature for a longer period of time. The kind mentioned, however, is not entirely satisfactory.

A study of the laboratory records giving the results of bacteriological examination of bottled raw milk taken from the delivery wagon shows that previous to August, 1912, but a small percentage of samples gave counts of less than 100,000 bacteria. About August, however, the regulations relating to cooling and bottling were put into effect. From August, 1912, to May, 1913, a majority of samples had a bacterial content of less than 100,000 per cubic centimeter.

After this date, however, the number of samples having over 100,000 bacteria per cubic centimeter greatly increased, some months being as high as 100 per cent, although the average remains below the standard of 500,000. Judging from the results of the analysis of bottled pasteurized milk collected under the same conditions, it has also increased in bacterial content until in many instances it is far from satisfactory. One could reasonably infer that the supervision over the milk supply has recently been less severe and that the methods used in handling the milk have therefore become lax. It should be stated, however, that recently the pasteurizing plants have installed the holding system, whereas previously they had used the flash method, therefore they should now produce a better quality of pasteurized milk.

The bacterial counts were made on agar, the strength and reaction of which was unknown, and the plates kept at room temperatures for periods varying from 24 to 72 hours. The time elapsing between the hour of collection and the hour of plating also varied considerably, as the bacteriologist, on account of his manifold duties, was not always able to plate promptly. In interpreting results, it is therefore necessary to make due allowance for faulty technique.

During the months of June, July, August, and September, 1914, an examination of 107 samples of milk for *colon bacilli* gave negative results.

The chemical examination of the milk supply during the last three years shows a steady improvement in the amount of chemical constituents, few samples at present being below the standard in butter-fat content. It would, however, be poor milk, indeed, that could not show 3 per cent of this ingredient.

The chief dairy and food inspector estimates that there are consumed daily in the city of Toledo 10,500 gallons of milk and 500 gallons of cream and that 90 per cent of this supply comes from Michigan and only 10 per cent from Ohio.

During the year 1914 there were brought two prosecutions for selling adulterated milk and one for refusing to take out a permit to sell milk. A conviction was obtained in each case.

Discussion.—It is evident that there should be employed a full-time bacteriologist who should immediately make a complete and scientific study of the milk supply, including bacterial counts and the presence of streptococci and leucocytes. Samples should be collected from the producing farms and milk depots, from pasteurizing plants just before and just after pasteurization, and from the delivery wagons. As near as possible these samples should be taken from the same consignment in order to determine the rate of increase in the number of bacteria through its different stages of production and transportation and the efficiency of the methods employed for

pasteurization, etc. In that way faults could be discovered and methods instituted for their correction.

The general principle should be accepted that in order to be sold raw milk must come from tuberculin-tested cows or must be pasteurized. So far as known the health department has made no effort to determine the presence of tubercle bacilli in the market milk of Toledo, but I am informed by the analyst of one pasteurizing plant that 17 per cent of the samples before pasteurization inoculated into guinea pigs produced tuberculosis. It should be the duty of the health department to carry on these investigations.

On account of the difficulty and expense experienced in the enforcement of a state-wide law requiring all milch cows to be tuberculin tested and the fact that contaminated milk is frequently responsible for outbreaks of typhoid fever, scarlet fever, and diphtheria, a wise regulation would be one requiring all market milk to be pasteurized except perhaps that coming from the certified farm, provided the standards set by the certified milk commission were lived up to.

A standard should be set for pasteurized milk, by which is meant that each plant should be required to install a thermoregulator and a temperature recorder, and that milk should be heated to 145 degrees for 30 minutes. Uniform heating should be insured by a properly constructed pasteurizer.

It is important that more inspectors be employed for the inspection of milk producing farms. Such men need not be veterinarians, but they should be intelligent, that they may secure the cooperation of the farmers and by educational means improve the conditions. One of the food inspectors and one of the best fitted of the sanitary policemen should be detailed for this purpose.

If raw milk continues to be sold, the cows from which it comes should be tuberculin tested and a higher bacteriological standard set. The maximum number of bacilli should be not more than 100,000 per cubic centimeter. Physical examinations of employees coming in contact with the milk should be insisted upon.

A standard should be set for raw milk which is to be pasteurized and this standard should be not more than 500,000 bacteria per cubic centimeter; above this number milk should be deemed unfit for human consumption.

It has been customary in the office to issue permits for the sale of milk without any inspection of the premises. This is a mistake and should be corrected. The milk inspector has also been inspecting stores where milk is sold. This is unnecessary as the inspector employed in inspecting foods can at the same time readily look out for the milk for sale. At present there is a duplication of visits to the same store. The milk inspector can better devote his time to the inspection of the milk at milk depots. To do this properly he

must be provided with sterile paddles and a lactometer and thermometer, as well as sterile sample bottles. An inspection of the contents of a can of milk is far more important than an inspection of the outside of the can.

In the event that such examination of bulk milk shows it to be below standard a sample should be taken for laboratory tests and the milk denatured with rennet and returned to the producer.

| Date. | Raw milk. | | | | | | Pasteurized milk. | | | |
|-----------------------------|--------------------|--|-------------------------------|--|-------------------------------|---|--------------------|----------------|----------------|----------------|
| | Number of samples. | Per cent containing 100,000 bacteria or under. | Average per cubic centimeter. | Per cent containing over 100,000 per cubic centimeter. | Average per cubic centimeter. | Average per cubic centimeter (all samples). | Number of samples. | Average count. | Maximum count. | Minimum count. |
| 1912. | | | | | | | | | | |
| January..... | 8 | 100 | 44,000 | ..... | ..... | 44,000 | ..... | ..... | ..... | ..... |
| February..... | 4 | ..... | ..... | 100 | 2,532,222 | 2,532,222 | ..... | ..... | ..... | ..... |
| March..... | 9 | 34 | 22,730 | 66 | 638,000 | 232,910 | ..... | ..... | ..... | ..... |
| April..... | 24 | 8 | 50,000 | 92 | 522,954 | 483,542 | ..... | ..... | ..... | ..... |
| May..... | 17 | ..... | ..... | 100 | 671,176 | 671,176 | ..... | ..... | ..... | ..... |
| June ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| July ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| August..... | 25 | 24 | 80,000 | 76 | 801,052 | 628,000 | 9 | 542,222 | 2,000,000 | 80,000 |
| September..... | 23 | 52 | 53,000 | 48 | 810,909 | 415,652 | 5 | 48,000 | 80,000 | 40,000 |
| October..... | 22 | 73 | 41,176 | 27 | 860,000 | 227,222 | 14 | 160,000 | 560,000 | 40,000 |
| November..... | 24 | 79 | 42,165 | 21 | 136,000 | 61,666 | 4 | 215,000 | 400,000 | 40,000 |
| December..... | 22 | 73 | 27,000 | 27 | 336,666 | 111,363 | 2 | 35,000 | 60,000 | 10,000 |
| 1913. | | | | | | | | | | |
| January..... | 30 | 86.6 | 29,615 | 13.4 | 265,000 | 61,000 | 2 | 20,000 | 20,000 | 20,000 |
| February..... | 25 | 88 | 41,363 | 12 | 113,333 | 50,360 | 3 | 36,666 | 80,000 | 10,000 |
| March..... | 29 | 62 | 36,666 | 38 | 201,818 | 99,310 | 3 | 43,333 | 100,000 | 10,000 |
| April..... | 24 | 75 | 17,100 | 25 | 260,000 | 102,833 | ..... | ..... | ..... | ..... |
| May..... | 28 | 89 | 19,200 | 11 | 383,333 | 58,214 | 3 | 13,333 | 20,000 | 10,000 |
| June..... | 30 | 23.4 | 72,285 | 76.6 | 305,652 | 247,666 | 2 | 275,000 | 300,000 | 200,000 |
| July..... | 23 | 13 | 80,000 | 87 | 242,500 | 221,304 | 1 | 200,000 | ..... | ..... |
| August..... | 22 | 20 | 50,000 | 80 | 233,888 | 200,455 | 2 | 45,000 | 60,000 | 30,000 |
| September..... | 24 | 4 | 80,000 | 96 | 225,217 | 260,833 | 8 | 297,500 | 420,000 | 100,000 |
| October..... | 12 | ..... | ..... | 100 | 447,583 | 447,583 | 4 | 280,000 | 410,000 | 30,000 |
| November..... | 16 | 6 | 60,000 | 94 | 328,666 | 311,875 | ..... | ..... | ..... | ..... |
| December ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1914. | | | | | | | | | | |
| January ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| February ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| March ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| April ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| May..... | 10 | 70 | 40,000 | 30 | 386,666 | 144,666 | 2 | 100,000 | 180,000 | 20,000 |
| June ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| July ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| August ¹..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| September..... | 23 | ..... | ..... | 100 | 388,260 | 388,260 | 2 | 390,000 | 400,000 | 380,000 |
| October..... | 29 | ..... | ..... | 100 | 430,345 | 430,345 | 7 | 389,285 | 460,000 | 200,000 |
| November..... | 20 | ..... | ..... | 100 | 401,000 | 401,000 | 4 | 360,000 | 400,000 | 300,000 |
| December..... | 16 | 25 | 30,000 | 75 | 258,333 | 258,333 | 8 | 176,250 | 300,000 | 50,000 |
| 1915. | | | | | | | | | | |
| January..... | 17 | ..... | ..... | 100 | 495,294 | 495,294 | 7 | 485,714 | 680,000 | 380,000 |

¹ No examinations.

The Inspection of Meats and Other Foods.

Requirements of statute.—Apparently many of the sections of the State food law can be enforced only by the State dairy and food commissioner or his agent. There are, however, three exceptions, namely, those provisions relating to the sale of unlabeled goods in

cans or jars, the sale of falsely stamped cans containing preserved fruit, vegetables or other foods, or mislabeled "soaked" goods, which it is specifically stated must be enforced by the local board of health. Fines are provided for violations in each instance.

A State law also authorizes the local board of health to employ food inspectors and to require permits to sell meat.

A statute also prohibits the cutting of ice from certain places or the sale of impure ice within the municipality. For violations of the sections relating to ice there is provided a fine of not to exceed \$100.

Requirements of ordinances.—City ordinances prohibit the sale of unwholesome food; define the age under which it is unlawful to kill any calf, lamb, or pig; prohibit the slaughter of overheated, diseased, or pregnant animals; provide for the killing and keeping of all animals and the preparation and keeping of all meat, fish, birds, and fowls so that the meat may remain in a good and safe condition for human consumption; prohibit the bringing into the city of damaged grain; prohibit the sale of adulterated or unwholesome food, including milk, and provides that the same may be seized and destroyed and that the owner be liable to fine and imprisonment.

The ordinances further state that it is the duty of persons having the knowledge to report the sale of food unfit for human consumption and that inspectors have the right to condemn and destroy such food or otherwise so dispose of it as to prevent its being used again or exposed for sale.

For a violation of the above ordinances there is provided a fine of not less than \$5 or more than \$50.

Requirements of regulations.—Regulations of the board of health prohibit the transportation of meat in the city unless it be securely wrapped or adequately covered. For violation there is provided a fine of not more than \$100.

Other regulations prohibit the sale of certain foodstuffs unless protected from flies, dust, dirt, or other injurious contaminations, and that no person suffering from a communicable disease may work in a building or part of a building where such foods are sold.

In promulgating these latter regulations the board made the mistake of attaching a penalty clause which conflicted with the State law providing a penalty for violation of any regulations of a local board of health. A number of prosecutions were brought but lost in court for the reason stated.

Methods of procedure.—There are at present three inspectors engaged in the inspection of food products, one inspector whose duty it is to inspect restaurants and one who devotes her time to the inspection of bakeries. As previously stated the dairy and food inspector, a veterinarian, is required to inspect animals before and

after slaughter. His duties, however, are too numerous to permit him to give the necessary time to any one subject.

The local slaughterhouses are just without the city limits. One is under United States Government supervision. All of the slaughterhouses visited personally were in fairly good sanitary condition. Certain nuisances have occurred from the methods of disposal of wastes and odors generated in rendering plants operated in connection with the business, but these have been or are being satisfactorily taken care of by the sanitary engineer of Lucas County.

Restaurants are scored twice a year and the results published in the monthly bulletin and in the daily papers.

A score card for bakeries is now being prepared.

On account of the far greater public health importance of the milk supply as compared to other foods, it would seem advisable to reduce the number of food inspectors to two, utilizing the third as an inspector of producing farms.

It would also seem advisable for the benefit of the food inspectors to assemble and publish all of the local ordinances and regulations and to promulgate and publish with them as regulations of the local board of health certain of the laws now being enforced by the agents of the State dairy and food commissioner as well as certain of the laws governing the sanitation of bakeries or other places where food is prepared, now enforced by the State industrial commission. In this way inspectors of the local board of health would have the same authority as State inspectors.

The Chemical Laboratory.

The chemical laboratory is maintained in conjunction with the diagnostic laboratory, and the criticism already made relative to the location of the latter would apply as well to the former.

Steps have already been taken, however, to secure better quarters and two larger, well-lighted, and well-ventilated rooms are now being equipped for laboratory purposes.

The work of the chemical laboratory consists of the chemical examination of milk and other food products and occasionally water.

Samples of milk are examined three times a week for fat content, solids nonfat, water, and the presence of preservatives. The results are published in the monthly bulletin.

Special attention is paid to the presence of visible dirt. The chemist has an interesting collection of cotton disks showing dirt filtered from the market milk of Toledo. This dirt is made up of manure, flies, insect larvæ, straw, etc. It should be stated, however, that more recently there has been a great improvement in the cleanliness of the milk.

Much work has been done in the laboratory with respect to the examination of cereals containing insect larvæ, the examination of spoiled canned goods, confections, etc.

The laboratory is well equipped with apparatus to perform most of the work that may be necessary in the enforcement of pure-food ordinances or regulations.

PUBLIC HEALTH SOCIAL SERVICE.

The public health activities requiring the services of physicians and nurses are carried on by four different organizations. The child welfare work forms a part of the health department, and the health super-

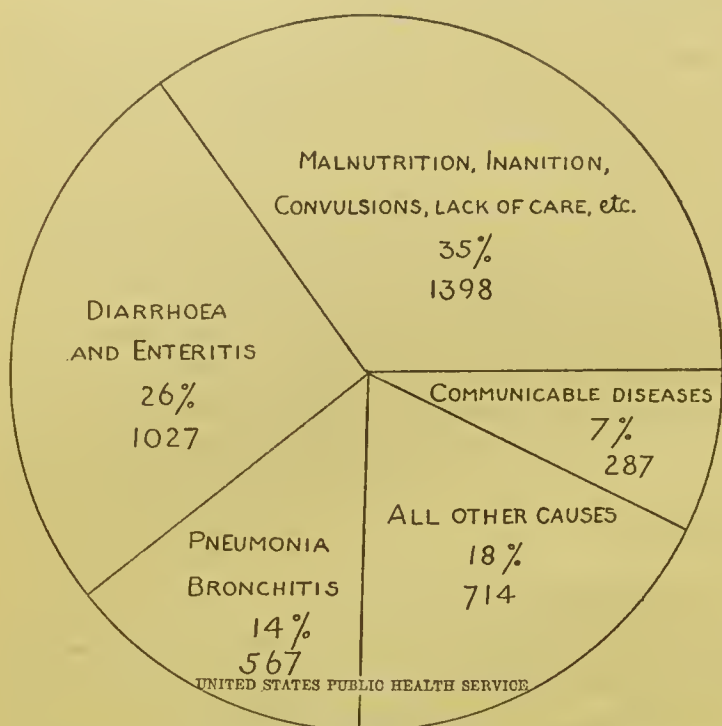


FIG. 6.—Total reported deaths: Infants under 1 year (exclusive of stillbirths), 3,993. Ten years, 1905-1915.

vision of schools comes under the jurisdiction of the board of education, while some communicable - disease nursing and the antituberculosis work are performed by private philanthropy. Thus there is a division of authority and a lack of cooperation not conducive to economy and efficiency.

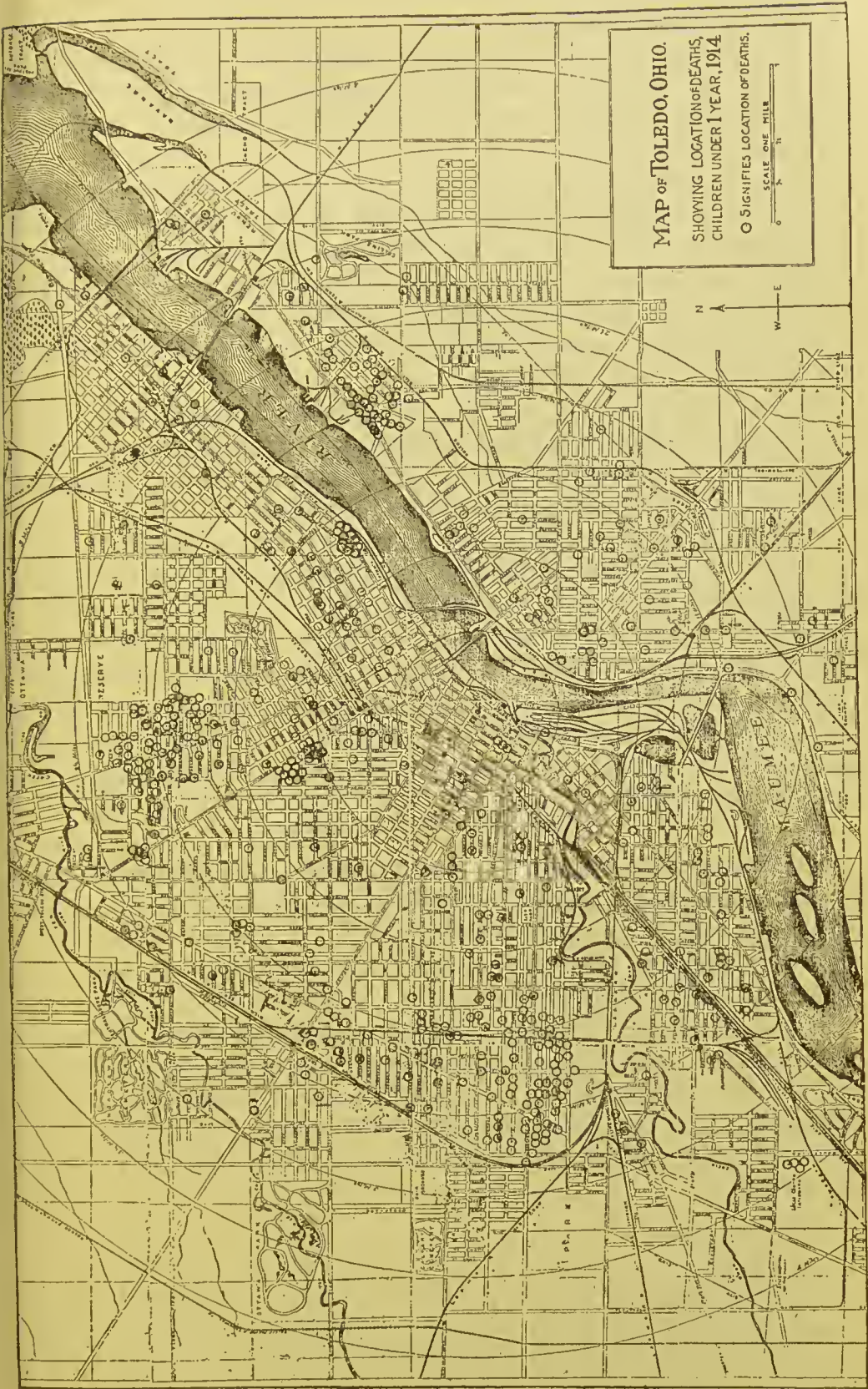
Infant Welfare Work.

During the last 10 years there have died in the city of

Toledo 3,993 infants under 1 year of age, stillbirths excluded. Of these deaths fully 80 per cent were preventable. (Fig. 6.)

During the year 1914 there were 473 deaths of infants under 1 year of age, exclusive of stillbirths, or 16.27 per cent of the total deaths occurring in the city. The infant death rate for 1914 was 109 per 1,000 births, there having been 4,340 births reported. Of these 473 deaths fully 80 per cent, or the lives of 378 infants, could have been saved.

While a certain amount of infant welfare work has been carried on by the District Nurse Association, the unnecessarily high death rate has made it clear for some time past that a special effort should be attempted to conserve the lives of infants through some organized work on the part of the health department. Accordingly in the



month of January, 1915, three infant-welfare stations were opened, each in charge of a nurse.

The medical work at the welfare stations is being performed by the medical inspector. It is only recently, however, that milk has been available to furnish the necessary treatment, and it is obtained through private charity.

The city council appropriated \$125 for the purchase of milk for the infant-welfare stations, but the attorney general afterwards ruled that the board of health could not furnish food except for those in quarantine. Food as used in this sense has quite a different significance than when applied to infant welfare work, milk in that case being a remedy, usually the only or at least the most important part of the treatment.

From its inception to April 1, 1915, the child-welfare division has treated 244 patients and the nurses have made 934 visits to the homes, giving nursing care and instructions or making investigations into the worthiness of applicants for relief.

It is the intention to gradually extend the work so that eventually not only will all births reported be followed up but prenatal as well as post-natal supervision will be exercised.

There is a state law regulating the keeping of maternity boarding houses and lying-in hospitals. Among other things it permits the State board of health to license all such places after the application for a license has been approved by the local board of health. The local board is also given the power to inspect any such house or hospital at any time.

Health Supervision of Schools.

This work is under the control of the local board of education and is performed by a small but efficient force consisting of four physicians, one dentist, and five nurses.

The physicians and the dentist are part-time officials. The nurses are employed full time.

The chief medical inspector receives a salary of \$1,200 for a year of 12 months. The medical inspectors receive \$750, the dentist \$500, and 3 nurses \$700 each for a year of 10 months, while the 2 nurses at the open-air schools receive \$900 for 12 months' services.

There are enrolled in the public schools of the city 28,749 pupils, as follows:

| | |
|-----------------------|---------|
| Elementary | 21, 789 |
| Kindergarten..... | 2, 922 |
| High school..... | 2, 586 |
| Night school..... | 1, 356 |
| Open-air schools..... | 96 |
| Total..... | 28, 749 |

This number represents 15.6 per cent of the total population.

There are 383 pupils (not included in the above total) enrolled in the special schools for the deaf, dumb, blind, and mentally deficient. No supervision is exercised over pupils of the high schools unless there is some special case needing attention.

Methods of procedure.—Upon enrollment, a pupil is given a thorough examination to determine defects, physical and mental, and the results are noted on a card. This card forms the permanent medical record of the child through the entire course of instruction and is filed at the school where the pupil may be in attendance.

To avoid confusion the cards for girls and those for boys are differently colored. They contain spaces for the name of pupil, address, school, grade and age as well as spaces to note any change of address, school, age, or grade. In addition the defects which must be especially looked for are tabulated, with corresponding spaces for the notation of the results of examination and the results of treatment on four different occasions, it being thought that four examinations during the school life of a child should be sufficient to obtain satisfactory results.

A defect is noted on the card by means of symbols, "o" meaning that the pupil has been excluded from school, "x" meaning the presence of a defect not of a serious nature, "xx" signifying a defect sufficiently serious to notify the parent that the child should consult a physician, and "xxx" implying that the defect is serious and needs immediate attention. All cards marked with a "xxx" are summarized on a special form or indexed so to speak, so that the cases may be followed up with facility. Little or no further attention is given to pupils with minor defects.

When a child is found suffering from a condition such as pediculosis, scabies, or other communicable disease requiring exclusion, a notice is made out in duplicate. The original is taken to the parent by the pupil with a circular in English or Hebrew, giving a method of treatment. If the child persistently returns to school without having used the remedy, treatment is applied at the school and the child sent home.

When defects require medical attention, a notice to that effect is made in duplicate and the original taken to the parent by the pupil. Accompanying this notice is a blank form to be filled in by the attending physician and returned to the medical inspector, stating what he has found upon examination and what advice he has given to the parents.

The medical examiners upon the completion of the day's work inclose the duplicate of the "exclusion" and "medical examination" notices in an envelope on the outside of which is a summary of the total number of pupils examined, name of school, number excluded and number of notices sent to parents advising them of physical defects needing attention. This is forwarded to the chief medical inspector.

Dental clinic.—The health supervision of schools includes a free dental clinic, which was originally established by the District Nurse Association but has since been taken over by the board of education.

Facilities for administering treatment have been installed in one of the schools and the dental surgeon devotes half of every week day to the work.

When the medical inspector finds a child whose teeth need attention the regular notice is sent to the parent with a card to be filled out and signed by the parent and taken to the dental clinic by the pupil. This is the authority for furnishing the treatment.

The dentist makes the necessary appointment and keeps a complete record of the defects found and the date of and kind of treatment furnished at each sitting.

In addition to dental relief the child is educated in the care of the teeth. An effort is made to have each child procure a toothbrush, and a circular is issued containing instructions for the care of the teeth.

It is estimated that about 80 per cent of the children own tooth brushes. In some cases it might be advisable to furnish them at cost price or free of charge.

Open-air schools.—There are two open-air public schools. One combines the features of a school and a sanatorium, and would be of incalculable value as an adjunct to any educational institution. It was built at a cost of \$13,099 and is used for pupils who show physical signs of tuberculosis in its incipency and a positive von Pirquet reaction. Open cases of tuberculosis are not taken, but, if possible, are sent to a hospital.

The building is comprised of two wings of two stories each, built to secure the maximum amount of fresh air, screened against flies, and protected against inclement weather by storm shutters, which, when wide open, form an unobstructed passage to the outside air on three sides of the wing. The lower floor of each wing is used for open-air classes; the upper floor forms a sleeping porch, one wing being used by the boys and the other by girls. The wings are connected by an inclosed, heated building, which contains separate toilets, tubs, and shower baths for boys and girls, kitchen, dining room, office, lockers, storerooms, etc.

The sleeping porches provide sufficient space for 60 cots and the enrollment in the school is, therefore, limited to 60 pupils. Needless to say, there is always a waiting list. The two open-air classes represent 8 different grades and are in charge of two teachers, and there are on duty night and day a graduate nurse and an assistant.

The unique features of this school are the facilities offered to pupils to remain day and night. In fact, many of the pupils, 35, to be exact, take advantage of this opportunity to sleep in the open air,

going home only for the period between Saturday afternoon and Sunday afternoon. Three meals a day are furnished to all pupils.

Except in the case of pupils who sleep at home and who have bathing facilities at home, every child is given a bath each day.

Careful records are kept of each pupil, including height, weight, chest measurement, temperature, pulse, respiration, with daily variations. A study of these records furnishes some very important data and warrants one in drawing at least one valuable conclusion, namely, that if a course of open-air instruction can produce such marked beneficial effects in the physically defective, its application to all classes of all schools would be equally valuable as a prophylactic measure. At least, it is unfortunate that the advantages of schools of this kind can not be extended to anemic, under-developed children not necessarily tuberculous. The expense to the board of education of maintaining the institution amounted, in 1914, to \$7,143.57.

The expense of furnishing subsistence is borne by the Thalian Society. It is estimated that the daily ration of three meals costs about 18 cents. The Thalian Society also furnishes the night nurse and an assistant. All other expenses incurred are defrayed by the board of education.

The other open-air school will accommodate 20 pupils. The children are given three meals a day, but no child remains over night.

Antituberculosis Activities.

The Thalian Society.—The activities directed toward the prevention of the spread of tuberculosis are carried on by the Thalian Society, which is the antituberculosis society of the city and is supported by funds raised on tag day. In 1914 the sum raised for this purpose was \$15,900, and in 1913 \$14,712.75.

There are seven physicians and five nurses engaged in this work.

There is one dispensary, which is comprised of a waiting room, office, examining rooms, pharmacy, and storerooms. The quarters are rather small for the work done, especially the waiting room, which is used in common by the tuberculous as well as other patients awaiting treatment by the city physician who has a consulting room adjoining. As the office hours are the same the waiting room is at times overcrowded, and it would be wise and only just for the city, which has but recently established its dispensary, to change the hours of consultation so that they would not conflict with those of the society.

Patients are referred to the antituberculosis dispensary by other charitable organizations, practicing physicians, other patients of the society, and the visiting nurses.

At the first visit to the dispensary a complete history of the patient is taken and entered on a special filing card together with the results

of physical and laboratory examinations. Additional forms are added for weight, temperature, change of treatment, or remarks at subsequent visits or examinations.

A careful sociological investigation is made by a visiting nurse for every new patient and the results of this investigation are filed with the patient's medical record.

The four visiting nurses each submit a daily report of visits made to patients' homes and other matters of interest connected with their duties and these reports together with a daily record of patients, old and new, treated at the dispensary are summarized in a ledger which is totaled at the end of the month and furnishes the information required for a monthly report.

To each patient is given an identification card, which is authority for further relief, a circular of information relating to the prevention of the spread of and cure of tuberculosis, a sputum cup, a paper pocket sputum flask, and paper napkins.

To handle the field work the city has been divided into four districts, in each of which is a visiting nurse. There are at present 765 patients on the visiting list, obviously too many for four nurses to supervise properly. An effort is made to visit the more seriously ill at least once or twice every week, but others are usually not seen more than once in every three or four weeks.

The von Pirquet reaction is frequently used as an aid to diagnosis in children under 12 years of age. Subcutaneous injection of Koch's Old Tuberculin for diagnosis is used in older children and in adults. The X ray is used extensively as a means of differential diagnosis in questionable cases.

Because of the limited funds and necessarily small staff the pressure of work will not permit of sufficient time to make sputum examinations. In this the society should be assisted by the diagnostic laboratory of the local health department, but unfortunately that laboratory will have to undergo a thorough reorganization before it will be in a position to lend its cooperation. Arrangements have been made with the State board of health laboratory for the examination of sputum.

When there are vacancies in the hospital for tuberculosis, patients are sent there, preference being given to advanced cases.

The hospital for tuberculosis.—This institution is maintained in connection with the Lucas County Infirmary.

The State law does not permit a county infirmary to accept cases of pulmonary tuberculosis unless in separate buildings. Accordingly there was erected and recently opened a tuberculosis hospital located on the same site as the infirmary. It will accommodate 75 beds and cost about \$65,000 or about \$866 a bed, not including the site.

The hospital consists of a brick administration building containing an office, quarters for nurses and a doctor, a kitchen and a dining

room; a brick building containing two wards, sleeping porches, private rooms, operating and dressing rooms; and two wooden pavilions for incipient cases.

The more one studies pulmonary tuberculosis the more one is convinced that the propagation of the disease is due to a very large extent to intimate contact between the sick and the well and that the prophylactic measures ordinarily taken are futile. Certainly little headway can be made against the spread of the disease until there are adequate hospital accommodations and until the compulsory hospitalization of all open cases at least is practiced.

This seems like an enormous undertaking but could be done if, with some State aid, each city, village, township, and county would provide out of its revenues the necessary facilities for isolation. Thus the expense would be more evenly divided and would not be so great a burden on any community. Let there be less expensive but more commodious buildings and then maintain them in a good state of preservation.

Such hospitals should be located within the centers of population which they serve. A patient should know that by going to the hospital he will still be in close touch with his family and friends, who can without expense or trouble visit him from time to time. The general public should be made to understand that it is not the hospital which spreads disease but that it is the infected person whose movements are unrestricted who is a danger to the community.

Tabulation of activities of the Thalian Society, March, 1914, to March, 1915.

| | |
|---|-------|
| Patients under care Mar. 1, 1914..... | 260 |
| Patients received during the year..... | 743 |
| Total number of patients cared for during the year..... | 1,003 |
| Total number of visits made during the year..... | 9,307 |
| Deaths from tuberculosis in Toledo (all forms) | 337 |
| Under supervision before death..... | 104 |
| Per cent..... | 32 |
| Cases registered with the State board of health..... | 305 |
| Patients sent to the Lucas County Sanatorium..... | 2 |
| As the result of nurses' instructions following fumigation after death: | |
| Percentage of houses cleaned..... | 90 |
| Bedding, etc., destroyed..... | 10 |
| Bedding, etc., sterilized..... | 75 |
| As the result of nurses' instructions following fumigation after removal: | |
| Percentage of houses cleaned..... | 50 |
| Bedding, etc., destroyed..... | 5 |
| Bedding, etc., sterilized..... | 70 |

The Toledo District Nurse Association.

This is an association supported by private philanthropy. The excellent work performed by this organization may be divided into two parts, first, that carried on by the graduate nursing staff, which

cares for the indigent sick and instructs the family as to hygiene and sanitation and how to prevent disease; second, the medical staff which furnishes free dispensary treatment to indigent sick women and children.

On the nursing staff are 1 superintendent and 14 other nurses, 10 of whom are employed in district work, 1 who devotes her time to social service, 1 who is in the eye department and cooperates with the State commission for the blind, and 2 who are engaged in the free dispensary work.

There are 12 physicians on the medical staff all of whom are specialists in the different branches of medicine involved in the treatment of women and children, except obstetrics. Nurses only are furnished in obstetrical cases.

The physicians receive no remuneration. Nurses are paid from \$50 to \$75 per month depending upon the length of service. The superintendent receives \$125 per month. Nurses also receive traveling expenses. The medical relief is furnished at the headquarters of the association, which contains examining rooms, pharmacy, a room in which minor operations are performed, offices, store rooms, etc. One room is equipped with three beds which may be occupied for the day by patients who have undergone minor operations, such as a tonsillectomy. For worthy cases suffering from more serious conditions, medical or surgical, hospital relief is provided.

The district nurses are furnished an office in the district in which they work. This office is supplied with the articles necessary in the discharge of their duties. Such articles include dressings, blankets, bandages, bedpans, ice bags, wheel chairs, and in fact everything that is required in nursing or necessary to make the patient more comfortable. These articles may be either given or loaned to the patient.

While much of the work performed by the association is not, strictly speaking, of a public-health nature, being concerned with the cure rather than the prevention of disease, the services rendered are of such great benefit to humanity that they will always be necessary in the community. However, that part of the work which is concerned with the communicable diseases, typhoid fever especially, should be taken over in large part by the nurses of the communicable-disease division of the health department.

Discussion.

The activities mentioned under the caption "Public health social service" are all more or less intimately related to public-health work, and, with the exception of the general nursing performed by the nurses of the District Nurse Association, should be correlated and placed under the control of the health officer. Such a step would put the entire public-health nursing service on a more economical and efficient

basis and would prevent to a large extent a duplication of visits to the home. Each nurse should have a district small enough to permit her, as far as practicable, to perform all of the duties required of her as a public-health official. Such duties would comprise the prevention of the spread of the communicable diseases, including the antituberculosis work, prenatal and postnatal supervision, the health supervision of schools, and the necessary social service. If all of these activities are eventually taken over by the health department, as they should be, there will be required not less than 30 full-time nurses.

The physicians engaged in the work contemplated above need not be employed on full time, but need only be required to furnish such time as will enable them to hold office hours at the antituberculosis and child-welfare stations and to perform the necessary work at the schools.

THE SANITARY POLICE.

This force is composed of 17 uniformed men, thus comprising more than one-half of the total number of employees of the board of health. They have police powers but no special qualifications for health work, nor has any effort been made to give them any training or to supervise their work.

The sanitary police are in charge of a sergeant who should be in a position to supervise the work of the men under him, but, as a matter of fact, his entire time is taken up in the investigation of the social status of people in quarantine, and where necessary, supplying them with subsistence, etc.

The sanitary policemen are each assigned to a district. The report for 1914 shows that they made 38,681 inspections, or about 10 inspections a day per man, allowing for Sundays and the annual vacation. There is no record of the number of reinspections. There were reported to the health department and an inspection made, or found as the result of an inspection, 11,910 nuisances, against each of which was issued a verbal or a written notice to abate, and according to the annual report all such orders were obeyed.

Included among the nuisances reported upon by the sanitary police one finds mentioned "foul vaults" (940), "full vaults" (1,589), and "catch basins and privy vaults located" (2,181). All such contrivances are foul and a menace to health whether full or only partially full. They should be abolished in compliance with existing State law and city ordinance.

In locating sites for new catch basins and privy vaults the health department is virtually assisting the typhoid bacillus to carry on its warfare. It is unnecessary for the board of health to place itself in this position as the State law provides that "except in cities having a building department or otherwise exercising the power to regulate the

erection of buildings, the board of health may regulate the location, construction and repair of water-closets, privies, cesspools, sinks, plumbing, and drains." It is to be noted that the city of Toledo has a building department. The health department should be interested only in seeing that all houses are made to properly connect to the sewer and that no plans for new buildings are approved unless modern toilet facilities are provided for.

Other items in the above list are "garbage and filth in yard" (2,094), "garbage and filth in alley" (2,068), "garbage and rubbish in street" (142), "houses filthy or damp" (52), "defective sidewalks" (11), "vacant lots filthy" (46), "defective plumbing" (59), "water-closets foul and leaking" (21), "dilapidated privies" (57), "obstructed sewers" (67), etc.

Among the items in the report of inspections of more special interest are "garbage boxes ordered" (3,011), "houses placarded" (2,095), "houses disinfected" (2,260), and "manure boxes ordered repaired or constructed" (835).

It will be noted that much of the work involved in making the above inspections is closely associated with the activities of the garbage and the plumbing divisions, so much so that it would not be out of place to place these divisions, in accordance with the practice in many other cities, under the control of the health department.

The police department should be in a position, through its patrolmen, to cooperate with the health department by noting all violations of the sanitary code and issuing notices to abate nuisances without necessarily calling upon the health department except where expert advice is necessary. The health department, through its chemical laboratory, is frequently called upon by the police department to examine for suspected poisons. All such requests are complied with promptly and without charge. It would be but fair on the part of the police to reciprocate by acting in the capacity of sanitary police. This has been done elsewhere with entire satisfaction and does not require any increase over the regular force.

Health departments should realize that they are not established solely for the purpose of abating nuisances and that they have a far more important duty to perform than the inspection of rubbish heaps.

The health department of Toledo has paid too much attention to trivial things, and has left undone many of the more important matters that count in the prevention of disease.

That the field activities have been practically of no avail is proven by the fact that typhoid fever, tuberculosis, diphtheria, and other communicable diseases continue unreduced.

The services of 11 sanitary police could be dispensed with to advantage. The money thus saved, \$9,900, could be utilized to pay a full-time epidemiologist, a full-time bacteriologist, and seven full-time public-health nurses.

THE HOUSING PROBLEM.

Like many other cities of its size, the housing problem has not as yet reached such proportions that it has become a serious matter, and yet there are isolated cases that need immediate action.

Requirement of laws.—The statutes bearing on the powers of council to pass ordinances to regulate the use of houses for human habitation are summarized as follows:

Authority is given to the city council "to regulate by ordinance, the use, repair and maintenance of buildings used for human habitation, the number of occupants, and the mode and manner of occupancy, for the purpose of insuring the healthful, safe, and sanitary environment of the occupants."

With the same object in view, the council may also "compel the owners of such buildings to alter, reconstruct, or modify them or any room, store, compartment, thereof" and "to prohibit the use or occupancy of such building until all orders have been complied with."

The city council may also provide "for the removal and repair of insecure buildings."

The local board of health, under the provisions of statute, may, after appraisal, destroy any building infected with smallpox or other dangerous communicable disease which can not, in the opinion of the board, be made safe by disinfection. The council is required to recompense the owner to the extent of the estimated value, and in the event that the owner is not satisfied with the amount allowed, he may sue for the value thereof.

Requirements of ordinances.—The local ordinances bearing on the housing problem, which are inadequate to meet the situation, are summarized as follows:

Where a building is unsafe or in danger of being set on fire by reason of some fault in its construction, the inspector of buildings may order that the owner place the building in a safe condition or demolish it. If the danger is immediate, the inspector may cause the necessary work to be done to render the building safe or may tear down and remove it.

A lodging house is defined as a building in which persons are accommodated with sleeping apartments; and includes hotels and apartment houses where cooking is not done in the several apartments.

A tenement house or flat building is defined as a building which, or any portion of which, is occupied or intended to be occupied as a dwelling by more than one family on any floor, living independently of one another and doing their cooking upon the premises.

By a basement or cellar is meant a story, the floor of which is 2 feet or more below the grade of the sidewalk, and the ceiling less than 9 feet above the sidewalk. All stories, the ceilings of which are 9 feet or more above the sidewalk must be considered first stories.

The height of any basement used for dwelling purposes or for sleeping apartments must be not less than 8 feet and the height of the ceiling above the grade must be not less than 4 feet. The basement must be properly drained and ventilated, and each apartment must have a window or windows leading to the outside, with not less than 9 square feet of glass for every 100 square feet of floor area.

To be considered habitable, or to be used as a habitation, a room in any dwelling, lodging, or tenement house hereafter built or in any building hereafter altered to be used as such, must be at least 8 feet in height in the clear. An attic may, however,

average 8 feet. Every such room must have one or more windows of an area of at least 10 per cent as great as that of the room. These windows must open either into the external air or into a room having one or more windows opening into the external air, with an area at least 20 per cent as great as that of said room. The top of at least one window in such room or rooms must be at least 7 feet from the floor and the upper sash must be movable.

The provisions above mentioned relating to the height of stories and window area apply to lodging and tenement houses as well as dwellings.

Livery, boarding, or sale stables, gas houses, gas reservoirs, and paint, oil, or varnish works are prohibited within 200 feet of any residence on either side of the street, in any block in which two-thirds of the buildings are devoted exclusively to residence purposes, unless with the written consent of a majority of the owners of the lots in such block and with the consent of certain of the city officials.

Every barn or stable, arranged for the keeping of more than four horses, four mules, or four cattle, must be provided with an adequate ventilating shaft, and where a public sewer is available, must be provided with a tight floor and drained into the sewer.

Water-closet compartments in lodging houses, factories, work shops, and public buildings must be made waterproof to a height six inches above the floor, except at the door, and all water-closets and urinal compartments must have a window opening to the outer air or into a ventilating shaft which has an area of not less than 10 square feet, where practicable.

The ordinances also provide that in lodging houses there must be one water-closet on each floor for each 15 people, and where there are more than 15 people there must be an additional water-closet for every 15 additional persons or fraction thereof.

The above summary is taken from the building code, which also contains provisions as to foundation, basement, and cellar walls. Such provisions, however, would not necessarily contemplate a rat-proof structure. The building ordinances were in fact not devised especially for the protection of the public health, but for adequate strength and fire protection.

An inspection made of some half dozen 5 and 10 cent lodging or "flop" houses, as they are called, disclosed an inexcusable condition calling for the immediate and serious attention of the authorities. The lack of modern toilet facilities and ventilation, the overcrowding, the filth and general insanitary surroundings proved beyond a doubt the necessity for adequate ordinances and efficient supervision. Not all were equally bad. In one at least a decided effort was made to maintain cleanliness which was particularly noticeable in a small, cheap restaurant operated in connection with the lodging house.

Ordinances are needed giving authority to the health department to vacate and under certain conditions to demolish houses unfit for human habitation.

All lodging houses or tenements should be registered in the health department, and no building should be used or remodeled for such purposes without the previous approval of the department. The amount of air space per individual should be specified; inside sleeping rooms in lodging houses should be prohibited; modern toilets and

bathing facilities should be required to be installed in compartments opening into the outside air and should be properly connected to the sewer; the owner should be required to air the rooms daily, to provide clean bedding at least weekly, to use an insecticide on the beds or bunks frequently, to furnish spittoons, and a proper garbage can and to keep the house and surroundings clean and free from accumulations of garbage and rubbish.

There should also be employed in the health department a capable inspector to enforce all ordinances covering the above requirements.

INDUSTRIAL HYGIENE.

The subject of industrial hygiene is especially interesting in Toledo on account of the importance of the city as an industrial center.

Both the State Board of Health and the Industrial Commission have made some valuable studies on the subject, but neither of these State bodies has sufficient funds nor a force of adequate number to enable it to go into details in the various communities.

Inasmuch as the entire matter is really one of prevention of disease and accidents, its regulation would logically be the function of a bureau of industrial hygiene of a State health department, and every local health department should be sufficiently well organized and equipped to act in the capacity of the local field agent of the State body.

Realizing that this idea is too ideal to be put into effect at this time, the chairman of the Committee on Public Health and Sanitation of the Toledo Commerce Club has devised a plan whereby the club would organize a bureau of industrial hygiene to study and improve conditions in the different places employing industrial workers.

The great benefit accruing to both employer and employee by a wise health supervision in industrial pursuits has been proven over and over again by concerns large enough to maintain health and sanitation divisions. Such a bureau in the Commerce Club would perform similar services for concerns employing a small number of men. The plan if put into execution would be a step in advance and would be of such great value both to the employee and the employer that it is to be hoped that the members of the Commerce Club will give it their heartiest support.

FLIES AND MOSQUITOES.

It is reported that these insects are a great pest during certain times of the year, the flies all through the warm weather, and the mosquitoes after about the middle of June.

On the first of April there was begun a sanitary survey and clean-up campaign carried on by the boy scouts under the auspices of the

Committee on Public Health and Sanitation of the Toledo Commerce Club and with the support of the health department. During the progress of the survey there was distributed educational literature on the housefly and fly swatters were sold. An effort was made to secure the cooperation of the citizens in properly caring for and disposing of manure and garbage.

The ordinances providing for the storage and disposal of manure are inadequate, and such as they are, are not obeyed. They should be amended and brought up to date, and then rigidly enforced. A "fly swatting" campaign can be effective only when at the same time the source of the trouble is attacked. More flies can breed in one improperly kept manure pile in a week than can be swatted in a year.

The present study of health conditions in Toledo will include an investigation of the species of mosquitoes prevalent, their breeding places, and how they can be eradicated. The studies of this subject have been deferred pending the first appearance of mosquitoes.

DISSEMINATION OF INFORMATION.

In addition to the circulars of information relating to the cause and prevention of diphtheria, scarlet fever, and typhoid fever, which are sent to each household from which a case of such disease is reported, the health department publishes a monthly bulletin containing the results of the examinations of milk samples, morbidity reports, and occasionally a short popular article on the subject of the milk or other food supply or the cause and prevention of some prevalent communicable disease. About 1,100 of these bulletins are sent out every month to milk dealers, doctors, health officers, and other interested persons.

The duties of a health department include those educational in nature, and it is highly desirable for such a department to inaugurate series of illustrated popular public health lectures, so that the people may be taught the nature of the work of the department in order to cooperate understandingly, and to be in sympathy with all work attempted.

The Committee on Public Health and Sanitation of the Toledo Commerce Club has established a system whereby they will, upon request, furnish a physician or dentist to give five-minute talks on public-health questions before schools, churches, or other public or private gathering. The idea is excellent, and the demand for the services of the lecturers is increasing every day.

REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths is provided for by State law which is placed for its enforcement in a bureau of vital statistics, a subdivision of the Department of State of Ohio.

Local registrars are appointed by the local board of health from a list of eligibles furnished by the Civil Service Commission.

Toledo forms a primary registration district and the position of local registrar is held by the clerk to the local board of health.

Practically all deaths occurring within the city are reported and great care is taken by the local registrar to secure full and accurate data before transmitting the certificates to the State registrar.

The same care is taken with birth certificates. However, many of the births occurring in the city are not reported, while many are reported only after long delay, all of which means unnecessary work for the registrar and faulty statistical data.

The Supreme Court has rendered a decision to the effect that physicians can not be compelled to fill out the whole of the certificate of birth but only that

part which refers to place of birth, address, name, plural births, color or race of mother, and the certification of the attending physician. When the physician refuses to submit a completely filled out certificate, the local registrar secures the additional information himself.

The antagonistic attitude of some practitioners of medicine in regard to submitting reports to a health department is often difficult to understand. Certainly there is something wrong in the system of medical education when men are graduated without having been thoroughly impressed with their obligations as physicians to the community and State.

During the year 1914 there were reported to the local registrar 2,846 deaths, which, with a population of 184,126, would give a death rate of 15.45.

For the same period there were registered 4,340 births, giving a birth rate of 23.57.

During the 10-year period 1905 to 1915 there were reported to the health department 23,459 deaths, fully 50 per cent of which could be classed as preventable (fig. 7).

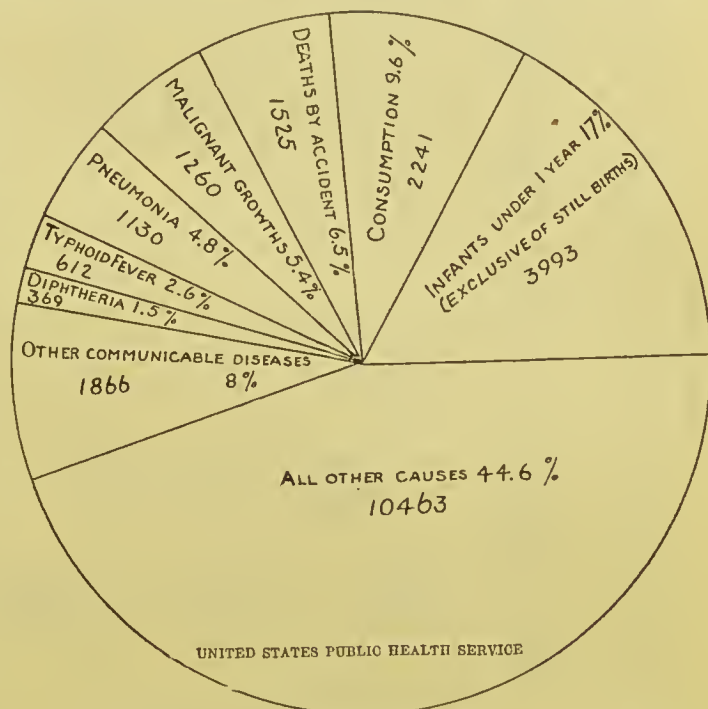


FIG. 7.—Total reported deaths, 23,459. Ten years, 1905-1915.

EXPENDITURES.

Tabulation of expenditures, health department, Toledo, Ohio, calendar year, 1914.

| | Adminis- tration. | Control of disease. | Sanitation. | Educa- tion. | Food in- specion. | Milk in- specion. | Diagnostic laboratory. | Chemical laboratory. | Registra- tion of births and deaths. ¹ | Total. |
|--|----------------------|------------------------|-------------|-----------------|----------------------|----------------------|---------------------------|-------------------------|--|-----------|
| Advertising..... | \$7.07 | | | | | | | | | \$7.07 |
| Automobile and maintenance..... | | | | | | | | | | 754.10 |
| Blanks and books..... | 3.25 | | \$27.80 | | | | | | \$0.45 | 31.50 |
| Books and subscriptions..... | 15.00 | | | | | | | | | 15.00 |
| Chemicals..... | | | | | | | | | | 19.98 |
| Charts and maps..... | | \$4.50 | 3.75 | | \$1.25 | | | | | 9.50 |
| Disinfection and disinfecting apparatus..... | | \$38.88 | | | | | | | | \$38.88 |
| Freight and express..... | | | | | | | | | | 71 |
| Furniture and repairs to furniture..... | | 24.00 | | | | | \$0.71 | | | 34.75 |
| Gas and electricity..... | 1.20 | | | | | | | 10.75 | | 12.95 |
| Laboratory equipment..... | | | | | | | 1.00 | 2.00 | | 4.20 |
| Laboratory supplies..... | | | | | | | 76.51 | 1.69 | | 78.20 |
| Miscellaneous..... | 5.65 | 13.67 | 34.75 | | | | 41.68 | 18.90 | | 60.98 |
| Office supplies..... | 14.40 | | | | 43.96 | | | 1.00 | | 99.03 |
| Paid for food samples..... | | | | | 19.80 | 43.09 | | | | 14.40 |
| Printing and binding (annual report, bulletins, forms, etc.)..... | | | | | | | | | | 62.89 |
| Quarantine (coal and food supplies)..... | 108.29 | 112.25 | 26.50 | \$177.50 | 50.25 | | 3.50 | 3.50 | 24.50 | 506.29 |
| Repairs and alterations..... | | 797.33 | | | | | | | | 797.33 |
| Salaries..... | | | | | | | | | | 2.10 |
| Stamps (postage and revenue)..... | 2,633.30 | 2,120.00 | 13,100.00 | | 3,055.53 | 2,400.00 | | 1,000.00 | | 24,308.83 |
| Stationery..... | 65.80 | | | | | | | | | 68.40 |
| Telephone and telegraph..... | 30.01 | | | | | | | | 2.60 | 30.01 |
| Towels and laundering..... | 30.00 | | | | | | | | | 30.00 |
| T. transportation..... | 16.00 | | | | | | | | | 16.00 |
| T. traveling expenses..... | | 4.60 | | | 111.50 | 23.00 | | | | 139.10 |
| T. typewriter supplies..... | 7.50 | | | 20.00 | | | | | | 20.00 |
| Uniform regalia (badges, etc.)..... | | | 7.14 | | 12.00 | | | | | 7.50 |
| Vaccines..... | | 1.59 | | | | | | | | 19.14 |
| Total ordinary expenses..... | 2,937.47 | 3,936.82 | 13,199.94 | 197.50 | 3,204.29 | 3,220.19 | 123.40 | 1,050.92 | 27.55 | 27,807.08 |

EMERGENCY EXPENDITURES FROM SPECIAL APPROPRIATION ON ACCOUNT OF SMALLPOX.

| | | | | | | | | | | | | |
|---|------------|-------------|----------|------------|------------|----------|------------|---------|--|--|--|-----------|
| Physicians (special services)..... | \$628.00 | | | | | | | | | | | \$628.00 |
| Physicians (vaccinators)..... | 2,637.50 | | | | | | | | | | | 2,637.50 |
| Quarantine guards (for contacts)..... | 10,012.00 | | | | | | | | | | | 10,012.00 |
| Quarantine (coal and food furnished to contacts)..... | 3,593.85 | | | | | | | | | | | 3,593.85 |
| Quarantine (incidental expenses)..... | 692.62 | | | | | | | | | | | 692.62 |
| Vaccine..... | 793.00 | | | | | | | | | | | 793.00 |
| Total ordinary and extraordinary expenses..... | \$2,937.47 | \$13,199.94 | \$197.50 | \$3,294.29 | \$3,220.19 | \$123.40 | \$1,059.92 | \$27.55 | | | | 46,354.05 |

1 The expenses incurred in the collection of vital statistics are borne mainly by the State and the county.

APPROPRIATIONS.

The city of Toledo, like other cities in Ohio, is in a very unfortunate condition financially because of a State law which limits a city's revenues to a 10-mill tax levy to provide for its ordinary maintenance as well as to assume its share in the support of the State and county government.

In addition to this 10-mill tax levy there is allowed a levy of not to exceed 5 mills which goes into a sinking fund to be used for the payment of interest on and the liquidation of bonds issued prior to June 2, 1911, or debts incurred subsequent to that date if incurred by authority of a direct vote of the people. According to a ruling of the supreme court all money borrowed subsequent to June 2, 1911, without such authority from the citizens must be paid out of the 10-mill tax levy.

It is obvious that a restriction such as above placed on a municipality by a State legislature prevents progress. A sufficient amount of money can not be raised to defray the ordinary expenses, and consequently to meet the demands of a growing community money must be borrowed and interest paid. This is expensive and unbusiness-like, for debts must be incurred and left to posterity to settle.

In addition to limiting the amount of taxes that may be levied, a State law has also abolished a certain number of saloons in each community without at the same time increasing the cost of the license for those that remain in business. This has resulted in a loss of revenue to the city of \$85,000 for the first six months of the year 1915.

In apportioning the 10-mill tax levy the State tax of 0.045 mill is first deducted. It is then assumed that the city requires for its ordinary maintenance 5 mills, and for its schools 5 mills, while 3 mills should go to the county. This, however, is a total of 13 mills, or more than is allowed by law, so that instead of 5 mills for ordinary maintenance the city gets but five-thirteenths of the money collected after deducting the State tax, the city schools get five-thirteenths of this amount and the county three-thirteenths. These proportional amounts are not fixed by law, so that it is left to the judgment of the budget commission to make a readjustment if any one of the recipients can get along with less money while others require more.

The tax duplicate for the year 1915 amounts to \$289,881,410. The money collected for the first six months of the year 1915 amounted to \$1,484,567.30. If this sum be doubled it will represent approximately the amount available for the entire year. There is, however, less collected during the last six months as compared to the first six months.

The revenues for the first six months were divided as follows:

| | |
|--|-------------|
| To the State..... | \$67,357.00 |
| To the county..... | 442,193.05 |
| Schools..... | 538,320.22 |
| To the city, ordinary maintenance..... | 436,697.03 |

1,484,567.30

The amount received by the city for ordinary maintenance was allotted in the following manner:

| | |
|---------------------------|----------------|
| Service..... | \$157, 441. 76 |
| Safety..... | 205, 364. 27 |
| Health..... | 21, 201. 32 |
| University..... | 10, 663. 39 |
| Library..... | 2, 885. 39 |
| General..... | 16, 183. 26 |
| Parks and boulevards..... | 19, 445. 00 |
| Hospital purposes..... | 3, 512. 64 |
| | <hr/> |
| | 436. 697. 03 |

For the year 1915 the health department received quite a substantial increase over the year 1914, or approximately \$42,402.64 in 1915, as compared to \$24,840.58 in 1914. This increase has been very helpful, but considering the large organization necessary to adequately handle all of the public health problems more money is needed.

The amount received by the school department is over 55 per cent of the total budget of the city. While this amount is not too much, considering the work done by the public schools, it is mentioned to emphasize the proportionately small amount allowed for public health purposes.

Likewise for police and fire protection there is allowed 21 per cent of the total revenues available to the city, as compared to 2.2 per cent for the protection of the public health.

The situation which Toledo is in financially is fully appreciated by the writer and might be a reason for reluctance on the part of the budget commission to allow larger funds for health and sanitation. Nevertheless it must be said emphatically that to carry on such work effectually more money is necessary. The minimum amount allowed for such purposes should not be less than 15 per cent of the city's available revenues. This would be for the year 1915, \$292,505 and should be divided so that \$75,000, or 5 per cent, should go to the health department and \$217,505, or 10 per cent, to the department of service for the collection of garbage, the collection of rubbish, street cleaning, and comfort stations. These figures represent an increase of appropriations over the present year of \$32,598 for public health and \$39,685 for sanitation and would be required for maintenance alone.

RECOMMENDATIONS.

As the result of a careful study of public health administration in Toledo extending over a period of over four months, certain definite conclusions have been reached and are made the basis of the following recommendations:

1. That there be created a department of health instead of a division as now provided for by the new charter.

2. That the health officer or director of the department of health be required to devote his full time to his duties; that his tenure of office depend on efficiency, and that he be paid a salary equivalent to that received by other department heads.

3. That for purposes of administration the health department be subdivided into the following divisions: Epidemiology, medical inspection, sanitary inspection, milk and food inspection, birth and death registration, diagnostic laboratory, chemical laboratory.

4. That a full-time epidemiologist be appointed to investigate the origin of each case of communicable disease occurring in the city, especially typhoid fever, scarlet fever, diphtheria, and measles, so that preventive measures may be taken promptly at the source.

5. That a full-time bacteriologist be appointed, and the scope of the work of the laboratory enlarged so that it will be of greater benefit to the health department and to the community.

6. That a thorough study be made of and a better supervision be maintained over the milk supply of the city.

7. That to assist in maintaining this supervision two dairy farm inspectors be appointed by transfer of two men best fitted for the position from the sanitary police force or the food inspectors.

8. That all of the market milk of Toledo be pasteurized before being offered for sale to the public.

9. That in order to prevent the spread of communicable diseases and to better handle the child-welfare work, the present nursing force be immediately increased by seven additional nurses, their duties to include the placarding of houses, the supervision of the prophylactic measures to be taken at the home, and similar measures.

10. That the sanitary police force be reduced to five men, each to have the general duties of a sanitary inspector. In addition to such duties, one, to be known as the chief inspector, to have general supervision over the others and to be held responsible for the efficiency of their work; one, to be known as the tenement-house inspector, to enforce the regulations of the board of health for maintaining the sanitary condition of tenement and lodging houses; and one, to be known as the fumigator, to devote such time as may be necessary to the fumigation of premises that have been occupied by persons suffering from communicable diseases requiring disinfection.

11. That the cooperation of the police force be obtained to investigate nuisances and to issue the necessary orders to abate the same.

12. That the isolation hospital be placed under the control of the health department, and that as soon as practicable a 400-bed hospital, conveniently located, be erected by the city of Toledo for the isolation and care of communicable diseases, with especial reference to open cases of pulmonary tuberculosis.

13. That all catch basins and privy vaults within the city be abolished, and that all premises be made to install flush closets properly connected to the sewer.

14. That all surface wells within the city be eliminated.

15. That water mains and street sewers be extended to all parts of the city as soon as possible.

16. That the plumbing ordinances be so amended that a safe but cheaper system of plumbing be required to be installed wherever necessary.

17. That the council appropriate a sufficient sum of money to defray the expense of installing plumbing in houses where the people can ill afford to pay for it, the expense so incurred by the city to be charged as a lien against the property, to be paid off in easy installments.

18. That the health department furnish disinfectants free of charge to families in which there is a case of typhoid fever.

19. That the health department administer antityphoid vaccine free of charge to those making application.

20. That in the case of diphtheria, cultures be taken from all contacts including pupils of the public or other schools when necessary, and that two negative cultures taken not less than 24 hours apart be required before a patient is released from quarantine.

21. That the collection of garbage be made in the residence portion of the city four times a week in summer and twice a week in winter in addition to the daily collection now being made from hotels and restaurants.

22. That electric or railroad cars be utilized to transport garbage to the reducing plant, in order to save long wagon hauls.

23. That the types of wagons adopted be such that they may be used both for garbage and rubbish.

24. That ashes and other rubbish be collected not less than twice a week and that the material collected be used for filling in low places.

25. That householders be required to keep separate receptacles for garbage and rubbish.

26. That more adequate regulations be promulgated relating to the disposal of stable manure.

27. That the practice of emptying sewage into the creeks be discontinued.

28. That as soon as practicable the antituberculosis work now being performed by the Thalian Society and the health supervision of schools now under the control of the board of education, be taken over by the health department.

29. That to perform these duties, as well as the others of a public health nature required of a health department, the nursing staff be

added to from time to time so that there will eventually be not less than 30 nurses employed.

30. That each nurse be given a district in which she shall perform all of the public health duties required.

31. That the educational work of the health department be extended.

32. That additional automobile transportation be furnished for the use of the dairy farm inspectors and the epidemiologist.

33. That the laws and ordinances relating to public health and the regulations, rules, and instructions of the board of health be assembled and published in booklet form for the information of the employees of the board, so that they may carry on their duties intelligently and understand their authority.

34. That the public health duties imposed by the new charter on the division of charities and corrections be transferred to the department of health.

35. That all citizens of the city cooperate with the health department in its efforts to suppress disease and that physicians make special effort to report promptly all cases of communicable diseases.

36. That special effort be made on the part of the physicians and others to report promptly all births occurring in the city.

37. That the record of expenditures be so kept that the health officer can call at any time for the financial status of any division of his department or piece of work.

38. That 15 per cent of the available revenues of the city be appropriated for purposes of public health and sanitation, \$75,000 for the health department and \$217,505 for the department of service, the latter amount to be used for the collection of garbage, ashes and rubbish, street cleaning, and comfort stations.

It is gratifying to report that the recently appointed health officer has already taken steps to reorganize the health department along the above lines. His efforts to have an efficient organization have been ably supported by the board of health, the newspapers of the city, and those citizens having the best interests of their city at heart.

UNITED STATES PUBLIC HEALTH SERVICE
RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION
IN NORTH DAKOTA

BY

CARROLL FOX

*Surgeon
United States Public Health Service*

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PUBLIC HEALTH ADMINISTRATION IN NORTH DAKOTA.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of public health administration and organization in North Dakota, carried on throughout a period of about seven weeks, beginning September 17, 1915.

The State of North Dakota has an area of approximately 70,195 square miles and, according to the State census of 1915, a population of 636,741. It is essentially an agricultural State, the principal product being grain. Cattle raising, coal mining, and dairying are also engaged in. Manufacturing is of minor importance. The nature of the principal industry is instrumental in bringing into the State in the spring and fall of the year a large floating population to work on the farms.

There are six cities having a population of over 5,000—Fargo, the largest, with 20,549; Grand Forks, next in size, with 13,554; Minot, with 10,053; Bismarck, with 6,344; and Jamestown, with 5,506. The capital, Bismarck, is located on the Missouri River, in the south central part of the State, and on the Northern Pacific and Soo Railroads.

For information and assistance received in this study the writer is indebted to the secretary of the State board of health and his clerk, the local health officers, and other State and county officials.

STATE BOARD OF HEALTH.

Composition of the board.—The board of health is composed of three members, one of whom is president, one vice president, and one the "superintendent" of public health. The attorney general is ex officio president of the board. The vice president and superintendent of public health are appointed by the governor. The superintendent must be a resident of the State, a graduate of a reputable medical college, and licensed to practice medicine within the State.

Tenure of office.—The appointees of the governor hold their office for two years from the first Tuesday in April succeeding their appointment and until their successors are elected and qualified.

Meetings of the board.—The board is required to meet as often as once in every six months at such place within the State as it may select.

Duties of the officers of the board.—The president presides at the meetings of the board, and in his absence the vice president performs the same duties. The superintendent of public health keeps the proceedings of the board and performs such other duties as are required by law or prescribed by the board of health. He is required

¹ Reprint from the Public Health Reports, vol. 30, No. 51, Dec. 17, 1915, pp. 3658-3688.

to submit biennial reports to the governor, showing the activities carried on by the board of health for the previous two years.

Compensation.—The president and vice president receive no salary, but each is allowed 5 cents for every mile traveled in the performance of his duties, and other necessary expenses. The superintendent of public health receives a salary of \$1,200 per year and the same allowances as the other members of the board. In addition to this, he is allowed \$1,100 for clerk hire, printing, traveling, and all other expenses of the board of health.

Powers and duties of the board.—The State board of health is empowered to fix the time and place of the meetings of the board; to make rules and regulations for the government of the board; to make and enforce all needful rules and regulations for the prevention and cure and to prevent the spread of any contagious, infectious, or "malarial" diseases among persons and domestic animals; to establish quarantine and isolate any person affected with contagious or infectious disease; to isolate, kill, or remove any animal affected with contagious or infectious disease; to remove or cause to be removed any dead, decaying, or putrid body or other substance that may endanger the health of persons or domestic animals; to condemn or cause to be destroyed any impure or diseased article of food that may be offered for sale; to superintend the several boards of health in cities, villages, and towns, and to make such rules and regulations as it may deem necessary to govern the preparation of dead bodies for transportation and to govern what classes of dead bodies may be transported and the manner thereof.

Secretary of the board of health.—The secretary of the board of health, who is known under the law as the "superintendent" of public health, is a part-time official, who, like the other members of the board, changes with each change of governors. The private office of the secretary is also the official office of the State health organization, and the location of the latter shifts to different parts of the State with each change of administration, depending on the locality in which the secretary happens to be engaged in the practice of medicine. It is rare to have any two members of the board in the same place at the same time except during the infrequent meetings of the board of health. The secretary is given one assistant, a clerk, who receives \$600 a year.

It is obvious that under the circumstances the health problems of the State can not be taken up seriously as far as the board of health is concerned. The lack of organization has resulted in other State bodies, working independently of each other, attempting to perform the duties of a State health department. Thus we find engaged in such work the State public health laboratory, the commissioner of food and drugs, the dairy commissioner, the hotel inspector, school boards, and the antituberculosis society. This independent work

can be only superficial, and no decisive results can be expected until the various public-health functions are correlated and placed in a properly organized health department under the direction of one full-time man.

The duties of the board of health and its secretary relating to diseases among animals have been largely taken over by the live-stock sanitary board, a State organization of more recent formation.

The State superintendent of health is also ex officio secretary of the embalmers' examining board.

REGISTRATION OF BIRTHS AND DEATHS.

The registration act of the State of North Dakota was passed in 1907 and conforms very closely in its provisions to the model law for the registration of births and deaths proposed by the United States Census Bureau. For this reason it is not necessary to summarize it in this report.

The State superintendent of health is ex officio State registrar of births and deaths. The city auditors and the clerks of the various townships and villages are ex officio local registrars for their respective districts. Local registrars in unorganized territory are appointed by the State registrar. The law makes provision for the appointment of deputy registrars by the local registrars, but records in the office of the State board of health fail to show the number that have been appointed to this position.

Local registrars receive a fee of 25 cents for each correctly made out birth or death certificate and "no report" card sent to the State registrar, except where the official acting as registrar receives a fixed salary. The fees are paid annually by the counties after certification by the State registrar.

Death registration.—During the 12-month period ended June 30, 1915, there were registered with the State registrar 3,504 deaths, exclusive of stillbirths. This number of deaths in a population of 636,741 gives a death rate of 5.5 per 1,000 inhabitants for the entire State. Such a low death rate is obviously incorrect. It signifies that the death registration is far from satisfactory.

The larger cities are striving to bring their registration to a high state of efficiency. The State records show that during the year ended June 30, 1915, the city of Fargo had 306 deaths, 61 of which were recorded as in nonresidents; therefore at least 245 deaths can be credited to the city, which number in a population of 20,549 gives a death rate of 11.9 per 1,000. Grand Forks during the same period had 183 deaths, 50 of which were recorded as in nonresidents; therefore there can then be credited to the city at least 133 deaths. The population being 13,554, this gives a death rate of 9.8. It is thought that an average of the death rates in these two cities might be used as a fair indication of the rate that should obtain in the State as a whole,

that is approximately 10. Therefore it may be assumed that at present only about 50 per cent of the deaths that actually occur in the State are registered.

The counties in the State having the highest death rates are Cass, with a rate of 9.7; Grand Forks, 9.8; and Burleigh, 9.7. These rates are more consistent with what actually occurs and are explained by the more efficient registration in the cities of Fargo, Grand Forks, and Bismarck, situated in these counties. If the registration in the rural communities were as complete, the rates would no doubt increase.

Notwithstanding that the death registration is very incomplete, an analysis of the certificates submitted is of interest. Of 3,504 deaths registered, 1,967, or 56.13 per cent, were due to causes that might have been prevented. These preventable deaths can be classified as follows:

| Disease. | Deaths. | Percent of total deaths. |
|--|---------|--------------------------|
| Typhoid fever..... | 46 | 1.31 |
| Measles..... | 28 | .80 |
| Whooping cough..... | 44 | 1.25 |
| Scarlet fever..... | 16 | .45 |
| Diphtheria..... | 23 | .66 |
| Influenza..... | 20 | .57 |
| Simple meningitis..... | 40 | 1.14 |
| Pulmonary tuberculosis..... | 183 | 5.37 |
| Other forms of tuberculosis..... | 58 | 1.66 |
| Pneumonia..... | 300 | 8.56 |
| Diarrhea and enteritis..... | 152 | 4.34 |
| Other preventable diseases..... | 96 | 2.74 |
| Malignant growths..... | 198 | 5.65 |
| Deaths due to accidents..... | 227 | 6.48 |
| Convulsions, congenital debility, malnutrition, accidents at birth, premature birth, and other causes peculiar to early infancy..... | 531 | 15.15 |
| Total..... | 1,967 | 56.13 |

The records show but six deaths attributed to syphilis. Of these, five occurred in infants under 1 year of age who were afflicted with the congenital form of the disease. There is every reason to believe that if many of the deaths reported as due to cirrhotic and sclerotic conditions were attributed to their real cause—namely, syphilis—the number of recorded deaths from preventable diseases would be greatly increased.

Infant mortality.—Of the total deaths from all causes 908, or approximately 25.6 per cent, occurred in children under 1 year of age. Of these deaths 851, or 93.72 per cent, might be classed as preventable, as follows:

| | Deaths. | Per cent of total deaths under 1 year. |
|--|---------|--|
| Pneumonia..... | 112 | 12.34 |
| Diarrhea and enteritis..... | 115 | 12.66 |
| Whooping cough..... | 34 | 3.74 |
| Other acute communicable diseases..... | 17 | 1.87 |
| Other infections..... | 40 | 4.41 |
| Premature birth..... | 164 | 18.06 |
| Injuries at birth..... | 18 | 1.98 |
| Convulsions, congenital debility, and other like causes..... | 351 | 38.66 |
| Total..... | 851 | 93.72 |

The recorded infant mortality rate of the State is 88, there having been 10,235 births registered during the 12-month period ended June 30, 1915, and 908 deaths in children under 1 year of age, exclusive of stillbirths.

Birth registration.—The number of births registered during the 12-month period was 10,235, exclusive of stillbirths, giving a birth rate for the entire State of 16. In certain of the counties, as, for instance, Burleigh, Dunn, Emmons, Golden Valley, Griggs, McIntosh, and Steele, the birth rate is very much higher, being over 20, and in one county, Golden Valley, reaching as high as 27.9. In the majority of counties, however, the birth registration is noticeably deficient.

Discussion.—After a careful examination of the death certificates on file it may be said in general that many of them are carelessly made out, necessary information is often missing, and not infrequently the cause of death is either not stated or is obscure or indefinite. The latter is explained to some extent by the fact that deaths, especially in infants, may occur in families living some distance from both doctor and registrar. Such children a physician often does not see at all.

The practice of issuing a burial permit and interring a corpse before a death certificate has been submitted is entirely too common in the State of North Dakota. In States having the best registration such a practice is not permitted. It is a direct violation of the law, and no doubt results at times in a failure through forgetfulness on the part of the undertaker to submit any death certificate at all. It is also questionable whether the city auditors and the clerks take sufficient interest in birth and death registration, for the reason that they have other duties to occupy their time. It is thought that perhaps some deputy registrars appointed from among the public-spirited women of the communities might result in better registration. It is also thought advisable to require that all places of interment within the State be licensed by the State board of health, and that such places be required to have a sexton or caretaker and to keep complete records of all bodies buried.

More responsibility should be placed on the parents in respect to the registration of births.

It is most essential that the State board of health be given a field force who may visit the localities, study the church records, records of the local cemeteries, and reports in the local newspapers, and by advice and instruction gradually educate the physicians and registrars and others in their obligations as regards the registration of births and deaths. If this does not produce the expected results, the board should then request the aid of the State's attorney. The registration act is very specific, and if enforced would bring the State into the registration area.

Believing that ministers are called to officiate at most burials, the State board of health has requested their assistance in having a death certificate properly made out and sent to the registrars, when it has not already been attended to. This is an excellent idea, and similar cooperation would be equally valuable in birth registration. This could be accomplished by ministers at the christening or other corresponding ceremony requiring evidence of previous registration of the birth of the child.

It is also necessary that someone be employed in the State board of health to devote his entire time to the registration of births and deaths. At present the force is absolutely inadequate.

Table of information relating to birth and death registration for the 12-month period ended June 30, 1915.

| County. | Population. | Number of registrars. | Number of birth certificates. | Birth rate. | Number of death certificates. | Death rate. | Number of still-births. | Number of "No report" cards. | Number of physicians. | Number of licensed embalmers. |
|--------------------|-------------|-----------------------|-------------------------------|-------------|-------------------------------|-------------|-------------------------|------------------------------|-----------------------|-------------------------------|
| Adams..... | 4,728 | 28 | 103 | 21.80 | 20 | 4.2 | 1 | 68 | 4 | 1 |
| Barnes..... | 18,706 | 48 | 352 | 18.80 | 111 | 5.9 | 12 | 99 | 19 | 6 |
| Benson..... | 12,705 | 42 | 234 | 18.41 | 50 | 3.9 | 4 | 61 | 17 | 4 |
| Billings..... | 3,250 | 6 | 47 | 14.46 | 10 | 3.0 | ----- | 18 | 2 | 1 |
| Bottineau..... | 17,337 | 58 | 226 | 13.03 | 70 | 4.0 | 4 | 70 | 15 | 8 |
| Bowman..... | 5,041 | 23 | 36 | 7.14 | ----- | ----- | 1 | 9 | 5 | 3 |
| Burke..... | 9,097 | 33 | 149 | 16.37 | 22 | 2.4 | 2 | 52 | 8 | 2 |
| Burleigh..... | 14,157 | 42 | 326 | 23.02 | 138 | 9.7 | 4 | 74 | 21 | 7 |
| Cass..... | 40,436 | 59 | 584 | 14.40 | 391 | 9.7 | 21 | 110 | 50 | 14 |
| Cavalier..... | 15,811 | 45 | 262 | 16.50 | 77 | 4.8 | 3 | 32 | 13 | 3 |
| Dickey..... | 10,094 | 37 | 146 | 14.40 | 42 | 4.1 | 1 | 59 | 9 | 4 |
| Divide..... | 8,894 | 35 | 152 | 17.10 | 26 | 2.1 | 3 | 71 | 7 | 2 |
| Dunn..... | 8,156 | 7 | 204 | 25.01 | 52 | 6.3 | 5 | 12 | 4 | 2 |
| Eddy..... | 5,684 | 13 | 106 | 18.60 | 22 | 3.8 | 3 | 33 | 6 | 2 |
| Emmons..... | 10,323 | 12 | 244 | 23.60 | 31 | 3.0 | 3 | 9 | 7 | 1 |
| Foster..... | 6,054 | 13 | 121 | 19.90 | 17 | 2.8 | 4 | 39 | 6 | 2 |
| Golden Valley..... | 6,038 | 14 | 169 | 27.90 | 34 | 5.6 | ----- | 27 | 5 | 2 |
| Grand Forks..... | 28,658 | 47 | 509 | 17.70 | 274 | 9.8 | 18 | 51 | 36 | 9 |
| Griggs..... | 6,567 | 23 | 149 | 22.60 | 28 | 4.2 | 5 | 49 | 6 | 1 |
| Hettinger..... | 7,711 | 24 | 105 | 13.60 | 39 | 5.0 | ----- | 45 | 5 | 3 |
| Kidder..... | 6,948 | 13 | 58 | 8.30 | 17 | 2.4 | 1 | 6 | 4 | 1 |
| LaMoure..... | 11,453 | 36 | 282 | 24.60 | 72 | 6.3 | 4 | 28 | 14 | 4 |
| Logan..... | 7,037 | 15 | 159 | 22.50 | 56 | 7.9 | 5 | 10 | 2 | ----- |
| McHenry..... | 16,950 | 47 | 179 | 10.56 | 49 | 2.9 | 3 | 55 | 11 | 7 |
| McIntosh..... | 8,020 | 7 | 202 | 25.10 | 72 | 8.9 | 4 | ----- | 3 | 1 |
| McKenzie..... | 10,809 | 36 | 244 | 22.50 | 50 | 4.6 | 2 | 37 | 5 | 1 |
| McLean..... | 15,879 | 32 | 173 | 10.90 | 37 | 2.3 | 4 | 49 | 11 | 1 |
| Mercer..... | 6,790 | 10 | 123 | 18.10 | 40 | 5.9 | 1 | 2 | 3 | ----- |
| Morton..... | 26,717 | 33 | 392 | 14.20 | 134 | 5.0 | 12 | 23 | 17 | 6 |
| Mountrail..... | 11,135 | 38 | 249 | 22.30 | 47 | 4.2 | 3 | 86 | 7 | 3 |
| Nelson..... | 10,331 | 34 | 208 | 20.10 | 55 | 5.3 | 6 | 54 | 9 | 3 |
| Oliver..... | 4,058 | 1 | 60 | 14.70 | 21 | 5.0 | 1 | ----- | 1 | ----- |
| Pembina..... | 14,341 | 33 | 265 | 18.40 | 80 | 5.0 | 7 | 36 | 13 | 5 |
| Pierce..... | 9,703 | 25 | 156 | 16.10 | 68 | 7.0 | 3 | 27 | 10 | 1 |
| Ramsey..... | 15,070 | 40 | 305 | 20.20 | 118 | 7.8 | 8 | 75 | 16 | 5 |
| Ransom..... | 11,045 | 26 | 199 | 18.01 | 62 | 5.6 | 2 | 45 | 9 | 6 |
| Renville..... | 8,098 | 30 | 144 | 17.70 | 40 | 4.9 | 1 | 34 | 9 | 2 |
| Richland..... | 21,265 | 45 | 243 | 11.40 | 93 | 4.3 | 9 | 74 | 25 | 9 |
| Rolette..... | 9,694 | 16 | 99 | 10.30 | 28 | 2.8 | 3 | 3 | 5 | 5 |
| Sargent..... | 9,634 | 30 | 137 | 14.20 | 30 | 3.1 | 1 | 57 | 9 | 5 |
| Sheridan..... | 8,169 | 11 | 62 | 7.50 | 26 | 3.1 | ----- | ----- | 2 | 1 |
| Sioux..... | 2,135 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 | ----- |
| Slope..... | 4,999 | 12 | 40 | 8.40 | 16 | 3.2 | ----- | 10 | ----- | ----- |
| Stark..... | 14,134 | 10 | 54 | 3.80 | 61 | 4.3 | 1 | 11 | 14 | 6 |
| Steele..... | 7,016 | 23 | 186 | 26.50 | 47 | 6.7 | 4 | 35 | 7 | 1 |
| Stutsman..... | 24,091 | 55 | 347 | 17.30 | 185 | 7.7 | 6 | 101 | 20 | 8 |
| Towner..... | 9,147 | 28 | 121 | 13.20 | 26 | 2.8 | 2 | 37 | 8 | 2 |
| Trail..... | 12,838 | 27 | 207 | 16.10 | 69 | 5.4 | 2 | 21 | 12 | 3 |
| Walsh..... | 20,373 | 49 | 272 | 13.30 | 114 | 5.6 | 4 | 55 | 16 | 7 |
| Ward..... | 28,068 | 63 | 384 | 13.60 | 169 | 6.0 | 5 | 74 | 30 | 8 |
| Wells..... | 13,204 | 23 | 151 | 11.40 | 48 | 3.6 | ----- | 36 | 17 | 3 |
| Williams..... | 18,143 | 57 | 310 | 17.08 | 120 | 6.6 | 5 | 123 | 16 | 7 |
| Total..... | 636,741 | 1,514 | 10,235 | ----- | 3,504 | ----- | 203 | 2,192 | 571 | 188 |

EPIDEMIOLOGICAL ACTIVITIES.

The law gives to the State board of health ample authority to promulgate regulations and to perform the work required to control communicable disease; but the totally inadequate appropriation provided by the legislature to employ the necessary specialists in public health, together with the inadvisable separation of certain public-health functions from the State board of health, precludes the possibility of that body engaging in active operations except through the agency of the part-time health officers. The latter are busy practitioners of medicine who can ill afford to neglect their practices for the meager compensation allowed by the county.

The activities of the board of health have been confined to the promulgation of regulations. In fact, there has been more epidemiological work done by the public health laboratory and even by the food and drug commissioner than has been performed by the State board of health.

Morbidity Reports.

Requirements of laws.—Physicians or other persons are required to report immediately to the local board of health all cases of tuberculosis, typhoid fever, or any other communicable disease coming to their knowledge, and if the physician is the attending physician he is required to report not less than twice each week the condition of the patient so afflicted, together with the state of the disease.

It is also required that physicians report within 24 hours to the local board of health each of his patients who has died of a communicable disease.

Keepers of boarding houses, hotels, lodging houses, etc., are required to report any communicable disease occurring among their guests.

Physicians practicing in cities under the commission form of government are required to report in writing to the commissioner of public health all patients under their charge who are sick with smallpox, scarlet fever, diphtheria, typhoid fever, Asiatic cholera, or any other dangerous or contagious disease within 24 hours after the nature of the same is suspected. The report is to be made upon a form prescribed by the State board of health.

For failure to make such report there is provided a fine of not less than \$25 nor more than \$100, or imprisonment for not exceeding 60 days, or both.

Requirements of regulations.—Every case of smallpox, diphtheria, scarlet fever, measles, or whooping cough must be reported in writing within 24 hours by the attending physician or other person having knowledge of the existence of the disease to the local health officer. The name of the disease with the name and address of the patient must be given. Tuberculosis and typhoid fever must be reported in writing as soon as a diagnosis is made. The name of the disease with the name and address of the patient must be given.

Method of procedure.—County and city health officers are required to submit to the State superintendent of health before the 10th of the following month a summary of the communicable diseases reported to them for the previous month. These summaries contain information as follows: Date, name of person affected, address, sex, color, age, name of disease, by whom reported, and results.

Discussion.—The following table has been prepared from the morbidity reports received from county and city health officers and the death certificates submitted during the 12-month period ended June 30, 1915:

| Disease. | Number of cases. | Number of deaths. | Death rate per 100,000. | Fatality rate per 100 cases. |
|-----------------------------|------------------|-------------------|-------------------------|------------------------------|
| Typhoid fever..... | 385 | 46 | 7.2 | 12.0 |
| Measles..... | 767 | 28 | 4.4 | 3.6 |
| Scarlet fever..... | 452 | 16 | 2.5 | 3.5 |
| Whooping cough..... | 234 | 44 | 6.9 | 18.8 |
| Diphtheria..... | 419 | 23 | 3.6 | 5.5 |
| Smallpox..... | 560 | ..... | ..... | ..... |
| Pulmonary tuberculosis..... | 153 | 188 | 29.3 | ..... |
| Pneumonia..... | ..... | 300 | 47.0 | ..... |
| Malignant growths..... | ..... | 198 | 31.0 | ..... |

From the case fatality rates of typhoid fever, measles, scarlet fever, and whooping cough it can safely be assumed that many more cases of these diseases occur than come to the notice of the board of health. The mortality from whooping cough seems to be especially high. It is probable, however, that the mortality from this disease is actually greater than is usually suspected.

Tuberculosis is especially poorly reported.

Pneumonia and cancer are not notifiable diseases in the State of North Dakota.

The death rates from the various communicable diseases are not high, but it must be kept in mind that the death registration is very deficient and that an increase in the total registration would necessarily mean an increase in the deaths reported from communicable diseases.

At present the morbidity reports are of little utility to the State. The lack of organization in the State board of health makes it impracticable to give the proper study to such reports so that preventive measures may be applied. Likewise, under the present system the work done in the public health laboratory of the university is of little utility in a preventive way, the State board of health not being in close touch with the results obtained and, unfortunately, not being in a position to make the best use of such results, even though notified.

The Control of Disease.

Requirements of laws.—In addition to the law giving the State board of health the power to make regulations, institute measures to eradicate and prevent the spread of disease, and to exercise supervisory control over local boards of health, certain other laws directed toward prevention of disease have been enacted and are summarized as follows:

The removal or transportation of any person suffering with a communicable disease or any body dead of a communicable disease without a certificate from the local or State board of health is prohibited.

Each parent or guardian having the care, custody, or control of any minor or other person is required to cause such person to be vaccinated.

School officials, parents, or guardians are prohibited from permitting any child suffering from scarlet fever, diphtheria, smallpox, whooping cough, measles, or other communicable disease, or any child residing in a house where such disease exists or has recently existed to attend any public or private school without the permission of the local board of health.

It is unlawful to allow dead bodies to remain unburied for a period longer than four days, or if such body has died of a communicable disease, longer than 24 hours. The local board of health may give a permit to extend this time. Bodies dead of a communicable disease must be disinfected when directed by the local board of health, and if the body remains unburied over 24 hours it must be inclosed in a tightly sealed metallic coffin and the funeral must be private. The law further specifies conditions under which such bodies may be removed or transported.

Ophthalmia neonatorum.—All birth certificates, in addition to the other data, must contain the question, "Were precautions taken against ophthalmia neonatorum?" and it is made unlawful for any attendant at a birth to collect for professional services unless this question is properly answered.

It is made a duty of every attendant upon a birth to examine the eyes of the newborn, and if there is any reason for suspecting a disease of the eyes, to apply a recognized prophylactic treatment.

If one or both eyes of an infant have become inflamed, swollen, or reddened, or show any unnatural discharge within two weeks after birth and no legally qualified physician is in attendance, it is made the duty of the parent or other person having the care of the infant to report the fact in writing within six hours to the health officer. This procedure is not required from recognized hospitals.

The health officer is required to place the infant in charge of a legally qualified physician for treatment or, if an indigent, in charge of the township or city physician.

For violation there is provided a fine of not less than \$10 nor more than \$50.

Tuberculosis.—When any local antituberculosis society considers it necessary to secure the services of a visiting nurse or to disinfect any building, room, etc., which has been occupied by a case of tuberculosis, it may report, with recommendations, to the chairman of the board of health and to the board of county commissioners. The latter is authorized to appropriate money out of the county funds to pay for the necessary disinfection, the services of visiting nurses, or medical attention or advice in preventing the spread of tuberculosis. The county commissioners are also authorized to cooperate with neighboring counties to establish homes or hospitals for incurable tuberculosis patients.

There is established by law a State tuberculosis sanitarium, which is located at Dunseith, in Rolette County. The law provides for its control by the State board of control, and also for the necessary officials to manage the institution. Tuberculosis in all its stages is cared for, but the incurable must be kept separate from the curable.

Each patient is required to reimburse the institution for the cost of his maintenance, or any society may defray such expense. Where the patient is an indigent a charge of \$7 per week is made against the county from which the patient came. The law further provides for the acceptance of gifts or donations, the construction of cottages by fraternal societies, etc.

Regulating marriages.—Marriage of a woman under the age of 45 years or a man of any age (except he marry a woman over the age of 45 years) is prohibited when one of the contracting parties is a common drunkard, habitual criminal, epileptic, imbecile, feeble-minded person, idiot or insane person, or person who is afflicted with hereditary insanity, with pulmonary tuberculosis in its advanced stages, or any contagious venereal disease.

No clergyman or other person authorized to solemnize marriages is permitted to perform a marriage ceremony between persons afflicted as above.

Before a marriage can take place the contracting parties must file with the county judge an affidavit to the effect that they are not feeble-minded, imbeciles, epileptics, insane, drunkards, or afflicted with tuberculosis in its advanced stages, and in addition the affidavit of the male applicant must show that he is not suffering from venereal disease.

Physicians are entitled to a fee of not to exceed \$2 for each examination made under the law.

Public drinking cups.—The use of public drinking cups on railroad trains, stations, or in public, parochial, or private schools or other educational institutions, and other public buildings of the State of North Dakota is prohibited.

For violation a penalty is provided of a fine not to exceed \$25 for each offense.

Violation of the health laws.—For violation of any health law or any rules or regulations made by any board of health or health officer or by any public officer under the authority of the health laws, and where no punishment is otherwise prescribed, there is provided a fine of not exceeding \$2,000 or imprisonment not exceeding one year, or both.

Every person who willfully opposes or obstructs any health officer, or physician charged with the enforcement of health laws, in performing any regular duty is guilty of a misdemeanor.

Requirements of regulations.—The regulations which have been promulgated by the State board of health for the purpose of controlling communicable diseases are summarized as follows:

In the case of smallpox, diphtheria, or scarlet fever the patient must be adequately isolated in the house or removed to an isolation hospital. The house must be placarded. Contacts must be rigidly quarantined until either the removal or isolation of the patient or until they have been disinfected, together with their clothes and that part of the building not occupied by the patient. They can not carry on their vocations without permission from the health officer.

It is forbidden to employ teachers having pulmonary tuberculosis in the public schools. Parents or guardians must not permit any child afflicted with pulmonary tuberculosis to attend any school or other public place.

Health officers must not give certificates releasing contacts from quarantine until after the period of incubation has elapsed, which in the case of scarlet fever is regarded as 7 days or longer; in the case of diphtheria as 4 weeks or until negative cultures have been secured from the throat and nose; and in case of smallpox for those never having had the disease and who have no well-marked vaccination scar as 14 days from date of last exposure. All who have been exposed must be vaccinated or revaccinated at once. Those who have had smallpox or have a typical vaccination scar may be released after disinfection. The health officer at his discretion may grant restricted liberty to any contact after disinfection and vaccination.

No child is permitted to enter any school until evidence of successful vaccination has been produced.

A health officer is prohibited from releasing any contact from quarantine until he is satisfied of the efficacy of the isolation, disinfection, vaccination, or the degree of immunity to the disease, and is satisfied also that such contact is not dangerous to the community.

The health officer is authorized to quarantine all suspected cases of communicable diseases until the correct diagnosis is made.

The minimum period for detention for the communicable diseases is as follows: For scarlet fever, until 5 days after the desquamation is complete, but in no case less than 30 days from the beginning of the disease; for diphtheria, 30 days, except where negative cultures are secured; for smallpox, until 5 days after the scabs have disappeared,

but in no case less than 21 days from the onset of the disease; for measles, 2 weeks; and for whooping cough, 1 week after the paroxysmal cough has ceased.

In typhoid fever the patient must be isolated, although absolute quarantine is not necessary. The stools must be disinfected. Certain disinfectants are recommended in the regulations.

In tuberculosis the patient must be instructed as to the disposition of the sputum and told that he should sleep alone in a well-ventilated room.

Attendants, physicians, health officers, and clergymen may be permitted to enter quarantined rooms by taking proper precautions to prevent spreading the disease.

No person exposed to smallpox, diphtheria, or scarlet fever may enter a public conveyance without a certificate from the health officer.

No room or building in which there has been any of the diseases mentioned in these regulations may be let until after disinfection and until a certificate is secured from the health officer. This provision also applies to rooms in hotels and lodging houses.

In case of a death from smallpox, diphtheria, scarlet fever, measles, and whooping cough no public funeral is permitted and the coffin containing the body may not be taken into any church or public building, or deposited in a public morgue.

Milk may not be sold from premises where any of the above diseases exist, nor shall it be sold if handled by any person living on such premises or exposed to infection, unless such person receive a certificate from the health officer.

The regulations specify methods for the disinfection of articles and rooms as well as of the patient.

Bodies of persons having died of any of the above diseases must be wrapped in a sheet soaked in a solution of corrosive sublimate, 1:500.

No isolation hospital may be established within 200 yards of any building.

When the superintendent of the State board of health is of the opinion that smallpox, diphtheria, scarlet fever, measles, whooping cough, or typhoid fever, is epidemic or threatens to become epidemic in any locality he may, as executive officer of the State board of health, take all necessary steps to prevent the spread of the disease and to eradicate it, including enforcement of quarantine, isolation, vaccination, disinfection, and the closure of schools.

It is the duty of a local health officer to disinfect, or cause to be disinfected, any body dead of smallpox, diphtheria, scarlet fever, or any other dangerous communicable disease.

The use of the common drinking cup is prohibited on all vehicles of common carriers, in waiting rooms, hotels, restaurants, boarding houses, stores, schools (public and private), State institutions, or other public places. The same applies to the common towel.

The school officials, parents, and guardians are authorized to prevent the attendance at school of all children suffering from smallpox, scarlet fever, diphtheria, measles, chicken-pox, tuberculosis, infantile paralysis, erysipelas, whooping cough, mumps, scabies, pediculosis, ringworm, trachoma, or any other communicable disease, without permission from the local health officer or school inspector.

The period of exclusion from school for children having the common communicable diseases is as follows: Scarlet fever, six weeks or longer if redness of the throat, nasal discharge, or other sequelae persist; measles, two weeks from the date of the appearance of the eruption; German measles, one week from the date of the appearance of the eruption; chicken-pox, until all scabs have disappeared; diphtheria, one week after securing the second negative culture from the nose and throat; whooping cough, eight weeks from the disappearance of the characteristic cough; mumps, three weeks or longer if swelling persists; pediculosis, until all parasites and nits are gone; ringworm, scabies, and impetigo, until examination reveals successful treatment; smallpox, after complete desquamation, but at least four weeks must have elapsed from appearance of eruption.

Discussion.—It has already been pointed out that the State board of health is not in a position to take any active part in the enforcement of these regulations, but must depend entirely on the local health officers, who in turn, in rural communities at least, depend to a very large extent upon the cooperation of the practicing physicians. There is no intention to minimize the efforts of the local and State officials or others who have been attempting to accomplish something toward the control of disease. The fact remains, however, that preventable diseases are all too common in the State, and deaths from these diseases too frequent. This merely indicates the lack of organization, without which productive results of a permanent nature can not be expected.

Tuberculosis.—It would perhaps not be far wrong to estimate that there were 5,000 cases of tuberculosis in the State of North Dakota, one-half of which were open cases and a menace to the community. During the year ended June 30, 1915, however, there were but 153 cases and 188 deaths reported to the health department.

The State institution, located at Dunseith, for the care of tuberculosis is built on the cottage plan and can accommodate only 60 patients. Both incipient and advanced cases are admitted. The advanced and incipient cases are segregated from each other.

There is also in the State an antituberculosis society, which during the coming year will receive financial assistance from the State to the extent of \$1,500. Except for this aid from the State the society is maintained entirely by money received from private sources. Its activities are legitimately those of a State health department and of such great importance to the community that the State should recognize its obligation to its citizens, take over these activities, and place them in a well-organized health department capable of making the necessary investigations and exercising the proper advisory and supervisory control over the disease. Money appropriated to a properly equipped health department would bring greater returns.

While the treatment of incipient cases of tuberculosis and the education of the people have their value, no great progress can be made in the eradication of the disease until means is provided for the isolation of all cases discharging tubercle bacilli in the sputum. Each of these is a focus of infection and the means of spreading the disease. Recent intensive surveys have indicated that the majority of individuals suffering from tuberculosis have contracted their infection from intimate contact with previously existing cases.

Each county is given the authority by statute to combine with other counties for the purpose of erecting hospitals for the care of the tuberculous, and it is most necessary that the county commissioners make immediate use of their authority in this respect and thus take an active part in the fight against tuberculosis. The

expense will thus be subdivided, and the patients may be isolated nearer to friends and relatives. When provision is made to isolate all open cases of tuberculosis, to pasteurize the milk supply, and to supervise and educate those suffering from the incipient form of the disease, as well as healthy people, tuberculosis will cease to be a serious problem.

Communicable diseases on vessels.—Because of the steamboat traffic on the Missouri River and the possibility of a person suffering from one of the communicable diseases disembarking, certain laws have been enacted to prevent the introduction of infection in this way. It has, however, not been thought necessary to summarize these laws in this report.

Diagnostic Laboratory.

The public health laboratory from its inception has been a part of the University of North Dakota, coming under the control of the trustees of that institution. It is under the immediate supervision of a director. The main laboratory is located in one of the university buildings at Grand Forks, and there are two branch laboratories, one at Bismarck and one at Minot, each of the latter being in charge of an assistant bacteriologist. At the main laboratory there is employed an assistant bacteriologist, one pathologist (part time), one technical assistant, and one stenographer (part time). For the maintenance of these three laboratories there is appropriated \$8,000 per annum.

The laboratory was established for the purpose of assisting the physicians and health officers in the diagnosis of disease, especially of the communicable diseases. As a public health laboratory its work includes the examination of cultures for diphtheria; of sputum for tubercle bacilli; of blood for the Widal reaction; of smears for pus organisms, especially gonococci; of animal's brains for the evidence of rabies; of stools for parasites; the bacteriological and chemical analysis of milk and water; and the examination of tumors for malignancy. The latter is certainly an important part of the work of a public health laboratory inasmuch as an early diagnosis is necessary in order to prolong life, which, after all, is the ultimate result to be attained by the worker in public health.

In addition to the above the laboratory is required by law to perform a large amount of clinical laboratory work, including the examination of stomach contents, blood counts, urine analysis, tissue sectioning, and the like. All tissue and tumor work is done in the main laboratory. This laboratory will soon be in a position to perform the Wasserman reaction as a routine measure.

During the year ended June 30, 1915, there were made 8,836 examinations. On a basis of \$8,000 per year for maintenance, this means a

cost per examination of approximately 90 cents. Of the total examinations, 3,863 were made in the main laboratory, 3,691 at the Minot branch, and 1,282 at the Bismarek branch.

The work done in the laboratory is highly efficient; but the results obtained can not be of great value from the public health standpoint until utilized by the epidemiologists of a properly organized health department. The epidemiologist, who is the active agent in the field, and the bacteriologist must work in close cooperation, and it is essential, therefore, that the laboratory be a part of the bureau of epidemiology of the health department. The directors of the laboratory, past and present, have done some excellent work along the lines of stream pollution, pointing out the dangers and encouraging localities to provide proper methods of sewage disposal. Good work has also been done in reference to pure water supplies and there is no doubt that the laboratory must be given much credit for the part it has played in securing better sanitary conditions. Up to the present time, however, little has been accomplished compared with what is necessary.

The officials in charge of the main as well as the branch laboratories devote part of their time to a general supervision over the milk supply or the water supply, or both, of the cities in which they are located.

The laboratory has issued several instructive popular bulletins relating to the subjects of rabies, tuberculosis, pure water, sewage disposal, and the extermination of flies.

A two years' course preparatory to the study of medicine is given at the University of North Dakota. The public health laboratory is therefore of great utility to the university, furnishing a means of teaching bacteriology to its students. However, a transfer of the control of this laboratory to the health department would not mean a change in its location, and material submitted for examination would be of equal value for teaching purposes.

PUBLIC HEALTH ENGINEERING.

Requirements of laws.—The only law which could be found bearing on the subject of sewage disposal is summarized as follows:

City councils or boards of trustees in incorporated villages are authorized to establish and maintain a general system of sewers, in such manner and under such regulations as the council may deem expedient. Sewage may be discharged into any river, but always below any dam that may be located within the corporate limits. Where no river is available, sewage may be discharged into a lake, coulee, or slough, in which case a septic tank must be employed for sewage from closets, kitchen sinks, or for anything carrying objectionable matter.

No provision is made for submitting the plans for sewerage systems to the State board of health for approval as regards the feasibility or efficacy of the methods adopted.

There is no law providing for the purity of water supplies, garbage disposal, or the disposal of trade wastes.

Discussion.—The State has not paid sufficient attention to this important phase of public health. The State board of health, which is responsible for the prevention of disease, has not been in a position to carry on work along these lines. A few communities have worked out the problem locally with more or less satisfaction. In its solution they have received aid from the public health laboratory, which has been making bacteriological and chemical examinations of water, and through investigations and publications has attempted to remedy some of the evils present. The director of the State laboratory and his assistants in charge of the branch laboratories have been detailed to exercise a general supervision over the water supplies of the cities in which they are located.

Water analyses have also been made in the laboratory of the commissioner of food and drugs, and through such analyses and the agency of his field force he has at times been instrumental in combating local outbreaks of typhoid fever.

In fact, it would seem that the State legislature has provided other State organizations with the money and men to carry out measures to prevent the spread of disease, while the State board of health, which was organized for that purpose and which morally has to assume the responsibility for the continued presence of preventable diseases within the State, has been neglected.

There are a number of places in the State where a thorough study of the water supply and the methods of sewage disposal should be conducted by a capable sanitary engineer, so that the communities may without waste of money provide themselves with a safe water supply and an efficient method of sewage disposal.

It would be the duty of the sanitary engineer of the State health department to make such investigations without cost to the localities, and he should have under his control a water and sewage laboratory in which to carry on the scientific part of the study. Likewise the methods of garbage collection are also in need of careful study, so that a system which is cheapest and most efficient for the locality may be instituted. The State of North Dakota is rapidly growing in population, and each year its public health engineering problems become of greater importance and more difficult to solve.

CONTROL OF THE MILK SUPPLY.

The laws enacted for the purpose of maintaining the purity of milk do not differ materially from those of other States and therefore will not be summarized here. Special provisions are made for applying the tuberculin test to dairy cattle and to cattle imported from other States.

The laws relating to the milk supply have been placed for their enforcement in the hands of the State food and drug commissioner and the State dairy commissioner. County health officers are also given authority to operate under State law, a provision inserted at the suggestion of the food and drug commissioner. It is a wise provision and will enable the State health department, under the proper organization, and the food and drug commissioner to cooperate to the fullest extent.

In the event of the formation of a district health organization, the district health officers should also be granted this authority. They could be made very active agents in the enforcement of laws to preserve the purity of milk.

Several cities have organized milk-inspection divisions which are carrying on with success activities directed toward the improvement of the milk supply.

The State food and drug commissioner will appoint local milk inspectors as his agents to serve without pay from the State. In this way his available force in the field is increased and better cooperation from the locality is secured, while at the same time the locality is benefited in that it may apply the State law to milk coming from places outside of its jurisdiction. This attitude on the part of the commissioner of food and drugs shows a most commendable desire to cooperate with other officials in the enforcement of law. Certain other States might well copy the system to their advantage.

LOCAL HEALTH AUTHORITIES.

Requirements of laws.—The laws relating to the formation and duties of local boards of health and the appointment and duties of local health officers are summarized as follows:

Local boards of health are authorized to remove for purposes of isolation any case of communicable disease, or, if the patient is not in a condition to be removed, to take such other action as may prevent the spread of the disease. The State board of health must be notified immediately of the existence and nature of the disease and measures adopted to prevent its spread. Local boards of health are authorized to provide temporary isolation hospitals, and all such places and the inmates therein are subject to the control of the local board of health. Local boards of health are also authorized to destroy infected clothing and allow reasonable reimbursement, or to provide necessary means for disinfection.

In order to prevent the spread of disease, local boards of health are authorized to employ the necessary physicians or other persons and provide such articles as may be necessary for the maintenance, welfare, and comfort of patients.

All such expenses must be paid, after proper certification, by the local government, either county, township, or city.

A patient, if able to pay, is required to reimburse the local government the cost of his maintenance, but if he is an indigent the expenses are paid by the county.

For violation of any provision of law by any health officer or member of board of health, or by any other person there is provided a fine of not less than \$10 nor more than \$50, or by imprisonment not to exceed 30 days, or both.

County boards of health.—The county board of health is composed of three members, one of whom is president, one vice president, and one the "superintendent" of public health. The State's attorney is ex officio president of the board. The county superintendent of schools is ex officio vice president. The "superintendent" of public health is appointed by the county commissioners. The qualifications required for the county superintendent of health are that he be learned in medicine and that he hold license to practice medicine in the State.

The members of the county board of health hold their office for one year and until their successors are elected and qualified.

The first meeting of the board occurs within 30 days after the appointment of the county superintendent of health and thereafter as often as once in every three months.

The county boards of health are given the power, within their respective counties, outside the corporate limits of cities having a city board of health and subject to the supervisory control of the State board of health and its secretary, to supervise all matters relating to the preservation of life and health of the people in the county, including water supplies and sewerage systems and the maintenance of quarantine, which it may declare, relax, modify, or abolish; to remove or abate any public or private nuisance; to isolate, kill, or remove any animal affected with a disease that may be communicated to human beings; to make and enforce ordinances or rules meeting any emergency, or when the local board of health has neglected or refused to act with promptness and efficiency or when no such board has been established. The law further provides that all expenses incurred in carrying out the duties of the county board of health must be paid the same as other county expenses.

The president presides at the meetings and in his absence the vice president performs the same duties. The county superintendent of health acts as secretary of the board and keeps records of all its proceedings, reports monthly to the State superintendent of health such proceedings as well as other official duties performed by him. He is also required to report immediately to the State superintendent of health whenever any communicable disease appears among persons or animals, or whenever the health of persons or domestic animals is endangered. He is likewise required to report before the 10th day of each month to the secretary of the State board of health the name and address of each patient suffering from a communicable disease with the name of person reporting same. He is required to superintend, subject to the supervision and control of the State board of health, the carrying out of all duties required of county boards of health; to exercise supervisory control over all local boards of health within the county; to furnish—at the expense of the county—blanks for the reporting of notifiable diseases to township, village clerks, and physicians; to investigate public milk supplies; to enforce cleanliness in schools; to investigate overcrowded, poorly ventilated, and insanitary school buildings; to carry out orders of the county board of health when the local board of health refuses to act; and to make sanitary inspection. He is held responsible for the thorough enforcement of the laws, regulations, and rules for the protection and conservation of public health.

The president and vice president each receive \$3 per day when actually engaged in the performance of their official duties and mileage amounting to 5 cents. The county superintendent of health receives from \$300 to \$600 per year, at the discretion of the county commissioners. In addition he also receives \$5 per day for every day or fraction thereof that he may be actually engaged in the performance of his official duties, not including work confined to his office, and mileage at the rate of 5 cents.

Township boards of health.—The board of health of the township is composed of the supervisors of the township and the trustees of each incorporated village, who, within their respective township or village, exercise, under the supervisory control of the county superintendent of health, all the powers necessary for the preservation of public health.

The board of health may examine into nuisances, sources of filth, and causes of sickness and make such temporary regulations regarding the same as it may deem necessary and must immediately report its action to the county superintendent of public health, who then investigates the matter and gives the board of health specific instructions.

For violation of any order of the board of health duly published there is provided a fine of not exceeding \$100 or imprisonment not exceeding three months.

The board has the authority to abate nuisances, to enter infected premises or vessels, to quarantine infected persons, to provide a nurse and other necessities for the patient, to provide isolation hospitals.

Boards of health in incorporated villages.—The board of trustees is empowered to construct and keep in repair culverts, drains, sewers, catch basins, manholes, cess-pools; to regulate the construction and use thereof; to declare what constitutes a nuisance and to abate the same; to impose the necessary fines relative thereto; to take such other means for the preservation of health and regulate, restrain, and prohibit the running at large of dogs and to impose a tax or license not to exceed \$2 on each male dog and \$3 on each female dog; to establish and regulate markets and build market houses; to direct the location and regulate the management and construction of packing houses, smokehouses, renderies, and slaughterhouses; and prohibit any offensive or unwholesome business or establishment within or less than 1 mile from the limits of the corporation; to compel the owner of any grocery, cellar, stable, pigsty, sewer, or other unwholesome or nauseous house or place to cleanse, abate, or remove the same, and regulate the location thereof.

City boards of health.—The city board of health is composed of the city engineer and the health officer and four aldermen designated by the mayor.

The city health officer is appointed by the mayor and confirmed by the city council and holds office for two years. When the State board of health is satisfied that the city health officer is not performing his duties, it may report the case to the city council, and at the next meeting the mayor must declare the office vacant and appoint another physician to fill the unexpired term. The health officer is secretary and executive officer of the board.

The board meets regularly once a quarter, and special meetings may be held at the call of the president and secretary.

The president and vice president perform the usual duties pertaining to their offices. The secretary keeps the proceedings of the board; determines whether all city ordinances, State laws, and regulations are being enforced; instructs physicians as to the proper method of reporting diseases; furnishes such blanks as may be prescribed by the State board of health; keeps data relative to the occurrence of communicable diseases; and reports by the tenth day of each month all communicable diseases to the State board of health, and such other data as may be required by that board.

The board of health is authorized to examine into all nuisances, sources of filth, and causes of sickness and to make the necessary regulations for the protection of public health and safety of the inhabitants.

For violation of any such regulations there is provided a fine of not exceeding \$100 or imprisonment in the county jail for not exceeding 30 days, or both.

All regulations made by the board of health must be properly published in some newspaper or posted in five separate places. Boards of health are authorized to order the abatement of any nuisance within 24 hours. If such order is not complied with, the board of health may remove the nuisance and charge the cost against the owner or occupant of the premises on which the nuisance occurred.

When permission to enter any building on the discharge of official duties is refused, a complaint is made to the justice of the peace, who is required to issue a warrant directed to the sheriff, or other peace officer, commanding him to take sufficient aid and at least one member of the board of health and to have the nuisance abated.

Commission form of city government.—In the commission form of government the commissioners have power to appoint or discharge for cause all subordinates. The commissioner of health is appointed as a subordinate in the department of streets and improvement. His salary is fixed by the commissioners and he has the authority to appoint his assistants. He is also given the authority granted by law to boards of health and to prepare rules and regulations for the preservation of public health. Such regulations must first, however, be approved by the commission before they can be enforced.

He is required to recommend to the commission such sanitary measures to be taken as may be necessary. He is given authority to inspect premises and to issue the necessary orders to abate nuisances or to correct conditions dangerous to the public health, and in the event that an order is not obeyed, to do the necessary work and charge the expense against the owner.

The commissioner of health is required, in addition to the other duties imposed upon him by the commissioners, to make such reports to the State board of health and to perform such other duties as may be required of health officers by statute.

Peace officers are required to render every assistance to the commissioner of health and the chief of police is authorized to detail one or more policemen, upon the requisition of the commissioner of health, to serve notices and perform such other duties as the commissioner may require.

For refusing to permit the health officer or any of his agents to enter any building at any time in the discharge of his official duties there is provided a fine of not less than \$10 nor more than \$100.

Discussion.—In each county there has been appointed a health officer who, with few exceptions, receives the minimum salary allowed by law, namely, \$300. This compensation is hardly sufficient to justify the exercise of much energy on the part of a health officer, as he must necessarily depend upon the practice of medicine for his living.

Health organization in the counties is markedly deficient. The work of the county health officer is usually confined to the supervision of the quarantinable diseases, which is not infrequently done by telephone through the assistance of other practicing physicians in the county. The county health officer also receives the morbidity reports from the physicians and transmits them to the State superintendent of health. A few other activities are occasionally engaged in; for instance, in Barnes County the county health officer is carrying on a medical inspection of schools. In Cass County there is no such inspection, but a school nurse has been employed by the educational authorities. She receives \$90 per month.

It can be said that the county health officers are men of high qualifications as physicians and capable of giving efficient services as health officers provided they receive sufficient remuneration to enable them to give their full time to the work. The same can be said of the health officers in the various cities visited. These men were receiving from \$200 a year, as in Jamestown, to \$900 a year, the salary paid in Fargo. In general the activities being carried on are not extensive, although in the larger cities there is some semblance

of organization. In Fargo there are to be found a system of garbage collection, a city laboratory, a system of school inspection carried on by the bureau of education, a milk-inspection division, a modern water-purification plant, and a 50-bed isolation hospital. There is also a nurse, employed by the associated charities, who cooperates with the health officer.

In Grand Forks the policemen act as sanitary inspectors. There is an eight-bed isolation hospital, a municipal slaughterhouse, and a system of garbage collection, the garbage being disposed of in an incinerator. A food inspector, a milk inspector, and a dairy inspector are employed by the health department. A social service nurse, who cooperates with the health officer, is employed by the associated charities and a school nurse by the board of education. The director of the State laboratory is also employed by the city to supervise the system of water purification.

Better organization in all of the communities will no doubt come in time. At present the cities are not large enough to warrant the employment of a full-time health officer. However, in every city of 5,000 inhabitants or over the part-time health officer should have at least one inspector trained in sanitary science as an assistant. In cities of under 5,000 a trained sanitarian may act as health officer.

In the counties it would seem better to work under the present system, and in addition to divide the State into not less than six districts, a full-time district health officer to be placed in each. This officer would be actively engaged in working out the different health problems in his district, receiving from local health officers such assistance as they could give, lending them moral support, and exercising a general advisory and supervisory control over them. The district health officers should be directly responsible to and under the control of the State board of health.

Public health activities carried on in cities visited.

| City. | Population. | Appropriation to health and sanitation. | Health officer (salary per annum). | Number of employees, exclusive of health officer. | Activities of health department. | | | | | | | | Other activities. | | Water supply. | Sewerage system. | Sewerage disposal. | |
|---------------|-------------|---|------------------------------------|---|----------------------------------|------------------|-------------------|------------------|----------------------|---------------------|-----------------|--------------------|--------------------------------------|------------------------|---------------|---|--------------------|--|
| | | | | | Quarantine and disinfection. | Milk inspection. | Dairy inspection. | Food inspection. | Sanitary inspection. | Garbage. | | | Isolation hospital (number of beds). | Diagnostic laboratory. | | | | Health supervision of schools (bureau of education). | Social service nursing (associated charities). |
| | | | | | | | | | Collection. | How paid for. | Disposal. | | | | | | | |
| Fargo..... | 20,549 | \$22,850 | 1 \$900 | 2 | Yes. | Yes. | Yes. | Yes. | Yes. | Yes..... | Health fund. | Dumped and burned. | 50 | Yes. | Yes. | Red River rapid sand filtration and hypochlorite treatment. | Yes. | Red River; untreated. |
| Grand Forks. | 13,554 | 8,000 | 1 400 | 16 | Yes. | Yes. | Yes. | Yes. | Yes. | Yes..... | do. | Incinerated. | 8 | (3) | Yes. | do. | Yes. | Do. |
| Jamestown.. | 5,506 | ..... | 1 200 | ..... | Yes. | ..... | ..... | ..... | ..... | Private collection. | ..... | Dumped..... | 7 | (3) | ..... | Driven wells; no treatment. | Yes. | James River septic tank. |
| Bismarck.... | 6,344 | 1,750 | 1 400 | 1 | Yes. | Yes. | Yes. | ..... | ..... | Yes..... | By householder. | do. | None. | (3) | ..... | Missouri River sedimentation. | Yes. | Irrigation. |
| Mandan..... | 4,142 | 900 | 1 300 | 2 | Yes. | Yes. | Yes. | ..... | ..... | Yes..... | Health fund. | do. | None. | (3) | ..... | do. | Yes. | Heart River; untreated. |
| Valley City.. | 4,783 | 300 | 1 300 | ..... | Yes. | Yes. | Yes. | ..... | ..... | Private collection. | ..... | do. | 6 | (3) | ..... | Driven wells; no treatment. | Yes. | Shenandoah River; untreated. |
| Minot..... | 10,053 | ..... | 1 600 | ..... | Yes. | ..... | ..... | ..... | ..... | Yes..... | ..... | do. | 6 | (3) | Yes. | Mouse River rapid sand filtration and hypochlorite treatment. | Yes. | Shenandoah River; untreated. |
| Devils Lake.. | 4,525 | 800 | 1 300 | 1 | Yes. | Yes. | Yes. | Yes. | ..... | Private collection. | ..... | do. | 6 | (3) | ..... | Driven wells; no treatment. | Yes. | Lake bottom; untreated. |

¹ Part time.² Includes policemen who act as sanitary inspectors.³ Use State laboratory.

Public health activities carried on in counties visited.

| County. | Popu- lation. | Expenses, health and sani- tation, 1915. | Health officer, salary per annum. | Quaran- tine and disinfect- tion. | Health supervision of schools. | Other activi- ties. |
|---------------|------------------|--|---|--|--------------------------------------|---------------------------|
| Cass..... | 40,436 | \$3,059.40 | \$300.00 | Yes..... | None..... | None. |
| Grand Forks.. | 28,658 | 1,400.00 | 300.00 | Yes..... | Yes; by nurse, bureau of education.. | Do. |
| Stutsman..... | 24,091 | 2,000.00 | 500.00 | Yes..... | None..... | Do. |
| Burleigh..... | 14,157 | 550.00 | 300.00 | Yes..... | do..... | Do. |
| Morton..... | 26,717 | 1,187.00 | 300.00 | Yes..... | do..... | Do. |
| Ward..... | 28,068 | 4,175.00 | 480.00 | Yes..... | do..... | Do. |
| Barnes..... | 18,706 | 807.17 | 300.00 | Yes..... | Yes; by county health officer..... | Do. |
| Ramsey..... | 15,070 | 500.00 | 300.00 | Yes..... | None..... | Do. |

HEALTH SUPERVISION OF SCHOOLS.

In a few instances only does one find any health supervision maintained over the children of the public schools. When such is observed it is usually found to be incomplete in that the services of either a physician or a nurse may be employed, but rarely the services of both.

Requirements of laws.—The law bearing on the subject of the employment of medical inspectors, together with other laws relating to schools and public health, is summarized as follows:

Authority is given to school boards, whenever petitioned by a majority of persons having children attending the schools of the district, to employ physicians as medical inspectors. It is the duty of such medical inspectors to examine at least once a year all school children, except those presenting a certificate of health from a licensed physician. Proper record must be kept for each child and a copy submitted to the superintendent of schools. Parents must be notified of the physical defects of their children with recommendations for conserving the child's health.

Medical inspectors of schools must cooperate with the State or local health officers in dealing with communicable diseases.

Local superintendents of schools are required to cooperate with school boards in promoting medical inspection. Blanks and other supplies must be furnished by the school board.

All plans and specifications of buildings to be used, in whole or part, as public-school buildings must be submitted to the State superintendent of public instruction for his approval before the buildings can be erected. The plans and specifications must show in detail the system of ventilating, heating, and lighting. No plans may be approved unless there is provided at least 12 square feet of floor space and 200 cubic feet of air space for each pupil in each study or recitation room. Light must be admitted from the left or from the left and rear of class rooms and the total light area must, unless strengthened by the use of reflecting lenses, be equal to at least 20 per cent of the floor space. All ceilings must be at least 12 feet in height. The ventilating system must be such that there will be at least 30 cubic feet of pure air every minute per pupil, warmed to maintain an average temperature of 70° F. during coldest weather, and the facilities for exhausting the foul air must be positive and independent of atmospheric changes. All public-school buildings must be kept clean and free from offensive smells arising from drains, privies, etc., and they must be provided with sufficient number of water-closets or other contrivances properly ventilated.

All toilet rooms must have outside ventilation and windows permitting free access of air and light.

When the county superintendent of schools reports to the county board of health that any school building or its outhouse is in an insanitary or unsafe condition, or that any pupil is alleged to be defective in mind or body, the board of health shall investigate and direct the school board to take the necessary action.

DISSEMINATION OF INFORMATION.

The State board of health publishes quarterly a 12-page bulletin, containing statistical data for the previous three months and original or compiled information of scientific and popular interest bearing on public health. About 1,925 copies of each issue of this bulletin are distributed to health officers, physicians, boards of health, embalmers, etc.

A biennial report is made to the governor.

The superintendent of public health has purchased at his own expense an interesting moving-picture film telling an instructive story of a man whose parents neglected to have his birth registered. It is a story with a moral and should be of great educational value. This film is loaned to the different cities, arrangements being previously made by the local health officer to have it exhibited in the local moving-picture houses. To show it requires about 15 minutes, and the only cost to the local officials is the payment of expressage, a matter of some 75 cents.

SANITATION OF HOTELS AND OTHER PLACES.

In order to maintain the hotels in a good sanitary condition, there is appointed by the governor a hotel inspector, who serves for a period of two years and who is required to inspect every hotel at least once each year. His salary is \$1,800. He is also entitled to traveling expenses. His reimbursement is paid from fees collected, which vary from \$2 to \$20, depending on the number of sleeping rooms in the hotel inspected.

This inspector should be placed under the administrative control of the State health department, as his work is closely associated with the sanitary problems of the State.

Requirements of laws.—The laws bearing on the sanitation of hotels, food-producing establishments, etc., are summarized as follows:

Hotel inspection.—Every hotel must be well drained, constructed, and plumbed according to established sanitary principles; must be kept clean and in a sanitary condition, and free from effluvia arising from any sewer, drain, privy, or other source within the control of the owner, manager, agent, or other person in charge; and must be provided with properly screened water-closets or privies for the separate use of males and females. These water-closets or privies must be disinfected as often as may be necessary to keep them at all times in a sanitary condition.

All bedrooms must be kept free from vermin and the bedding must be clean and sufficient in quantity and quality; all sheets must be at least 8 feet in length, and each guest must be furnished with two towels. In case bedrooms are carpeted the carpet thereon must be taken up and thoroughly cleansed at least once each year.

No rusted tin nor iron vessel or utensil may be used in cooking food, and all foodstuffs must be kept in a clean and suitable place, free from dampness and contact with dirty water. The floors, closets, cupboards, and walls of all kitchens must at all times be kept free from dirt and no dust or grease be allowed to collect thereon. A metal container must be provided to hold ashes where such ashes are stored in or around the hotel building. In all cases where a patient having an infectious or contagious disease has been confined in a hotel room, such room must, upon the removal of the patient, be closed and fumigated, and upon the completion of such fumigation the certificate of a reputable physician to that effect must be forwarded to the hotel inspector. In all hotels or lodging houses where 50 cents or more per night is charged for lodging the sheets and pillow cases must be changed after the departure of each guest, and it is unlawful to have upon a bed in any such hotel or lodging house a mattress of a lower grade than that commonly known to the trade as cotton-felt combination; each mattress must weigh at least 35 pounds unless it be a hair mattress, in which case it may weigh 30 pounds or more. Each hotel, rooming house, or restaurant where 50 cents or more per meal is charged is required to keep in its main public wash-room, individual towels or paper toweling in full view and reach of all guests at all hours. Each room must be properly ventilated by at least one window and by a doorway leading into the hall. All hotel windows must be screened against flies and mosquitoes.

For violation of this law there is provided a fine of not less than \$10 nor more than \$50, or by imprisonment, or both.

Hotels are required to furnish to their guests pure water free from disease germs, taken from a source far enough away from privy vaults or other means of contamination to insure freedom from pollution. Such water supply is subject to the inspection of the hotel inspector, and when found unfit for drinking purposes its use must be discontinued.

In addition to the sanitary provisions, provision is also made for adequate fire escapes, fire extinguishers, protected elevator shafts, and other contrivances for the safety of the guests.

Railroad stations and passenger coaches.—All railroad companies are required to maintain at railroad stations where passenger tickets are sold an approved form of toilet. Where a sewerage system is maintained within 300 feet of the station the water-closet must be within the house. Separate compartments must be provided for men and women. In the compartments for men there must be provided urinals draining into a sewer, vault, or other suitable place which will prevent the creation of a nuisance.

The board of railroad commissioners of the State or any local health officer is granted authority to inspect such installations, and if they are found insanitary it is the duty of the railroad company to make such alterations or repairs as will remedy the condition.

Waiting rooms must be scrubbed at least once a week with a standard disinfectant and must be maintained at all times in a comfortable and sanitary condition.

For violation there is provided a fine of not less than \$20 nor more than \$100.

It is prohibited to sweep any railroad coach occupied by passengers except the sweeping be done by some vacuum device, or except when the floor is first moistened by water or oil or some sweeping compound.

For violation there is provided a fine not to exceed \$25.

Sanitation of barber shops.—Barbers or barbers' apprentices and all persons engaged in hair dressing or manicuring must disinfect their tools in a manner approved by the State board of health before they are used on any of their customers.

For violation there is provided a fine of not less than \$25 nor more than \$200.

Disinfection of vehicles.—All cars, coaches, or boats transporting passengers in or through the State must be disinfected in an approved manner not more than 30 days from the date of use of such vehicle.

It is made the duty of every corporation engaged in the transportation of passengers to keep posted in the vehicle a printed notice stating the time and place at which the car, coach, or boat was last disinfected.

For violation there is provided a fine of not more than \$100.

Disinfection of second-hand goods.—It is made the duty of all dealers in second-hand goods to disinfect, in a manner approved by the State board of health, all second-hand furniture, bed clothes, wearing apparel, kitchen utensils, etc., before they are sold.

Sanitation of food-producing establishments.—Every building, room, basement, or cellar used as a bakery, cannery, packing house, slaughterhouse, dairy, creamery, cheese factory, restaurant, hotel, grocery, meat market, or other place of similar character, must be properly lighted, drained, plumbed, and ventilated, and must be conducted with strict regard to the influence of the surroundings on the health of the employees and the purity and wholesomeness of the food sold or manufactured therein.

All such establishments or vehicles used in the transportation of food products must be maintained in a sanitary condition. Food must be protected from flies, dirt, or other foreign or injurious substance. All apparatus used in the preparation must be thoroughly cleaned daily and the clothing of employees maintained in a cleanly state.

The interior of all rooms must be plastered, wainscoted, or ceiled with metal or lumber, oil painted or lime washed, and all painted surfaces must be kept clean by washing with soap and water. Floors must be made of an impervious material, such as cement, tile, brick, or wood, which can be flushed and washed clean with water.

All doors, windows, or other openings, during fly season, must be fitted with self-closing screen doors and wire window screens of a mesh not coarser than 14.

All places selling or manufacturing food must be provided with toilets separate from the room where the food is handled. The toilet compartment must have a floor made of a nonabsorbent material, which must be washed daily. These compartments must be properly ventilated. Lavatories supplied with soap, running water, and towels must be provided adjacent to toilets. The employees are required before handling any food or after visiting toilets to wash their hands and arms thoroughly in clean water.

When necessary, cuspidors must be provided. Expectoration, except into the cuspidors, is prohibited. Cuspidors must be washed out daily and disinfected, and at least 5 ounces of the disinfectant must be left in the cuspidor while in use.

No room in which food is handled may be used for sleeping purposes. No person is allowed to work in any place where food is handled who is affected with any venereal disease, smallpox, diphtheria, scarlet fever, yellow fever, tuberculosis, bubonic plague, Asiatic cholera, leprosy, trachoma, typhoid fever, epidemic dysentery, measles, mumps, German measles, whooping cough, chicken-pox, or any other communicable disease.

Inspectors or agents of the food commissioner are authorized to enter at all reasonable times every place where food products are manufactured or sold, and provision is made for the procedure to be carried out in the abatement of nuisances or in case of violation of the law.

For violation of this act adequate penalties are provided.

EXPENDITURES AND APPROPRIATIONS.

For the two-year period ended June 30, 1915, there were appropriated by the State legislature to the State board of health \$5,400, or \$2,700 per annum. The last legislature, however, reduced this amount, so that for the two-year period ending June 30, 1917, there is available to the State board of health only \$4,600, or \$2,300 per

annum. This legislature likewise saw fit to limit expenditures from this fund to definite amounts for specific purposes. A health organization which is really active is continually meeting emergencies. A health officer is not a prophet, and it is impossible for him to foretell what amounts he may require to meet these emergencies. To limit his activities by this means greatly interferes with efficient public health work. The money appropriated was allotted as follows:

| | |
|---|----------|
| Superintendent of public health, \$1,200 per annum..... | \$2, 400 |
| One stenographer, \$600 per annum..... | 1, 200 |
| Postage..... | 200 |
| Office supplies..... | 100 |
| Traveling expense..... | 200 |
| Printing..... | 400 |
| Miscellaneous expense—telephone, express, etc..... | 100 |
| Total..... | 4, 600 |

From the above table it may be assumed that the activities of the board of health must be confined to the office, and it can be most emphatically stated that work of this kind is futile. A State board of health without a field force can accomplish nothing.

The following table shows the expenditures during the year ended June 30, 1915:

| | Execu- tive office and board of health. | Educa- tional. | Vital sta- tistics. | Epidem- iology. | Total. |
|--|---|-------------------|------------------------|--------------------|-----------|
| Dues, State and provincial boards of health..... | \$10.00 | | | | \$10.00 |
| Express..... | .81 | \$0.84 | \$1.37 | | 3.02 |
| Office supplies..... | 2.59 | | 1.65 | \$12.00 | 16.24 |
| Postage..... | 30.00 | 3.96 | 64.00 | | 97.96 |
| Printing and binding..... | | 136.50 | 192.60 | | 329.10 |
| Rent of vault..... | | | 60.00 | | 60.00 |
| Salaries..... | 1, 920.00 | | | | 1, 920.00 |
| Salaries (emergency clerks)..... | 70.00 | | | | 70.00 |
| Stationery..... | 45.90 | | | | 45.90 |
| Telephone and telegraph..... | | | | 1.56 | 1.56 |
| Traveling expenses..... | 32.00 | | | | 32.00 |
| Total..... | 2, 111.30 | 141.30 | 319.62 | 13.56 | 2, 585.78 |

In addition to the money appropriated to the State board of health there were appropriated for the biennial period ending June 30, 1917, to the public health laboratory \$16,000, or \$8,000 per annum, and to the Antituberculosis Association \$2,000, or \$500 for the year 1915 and \$1,500 for the year 1916. Thus there has been appropriated for strictly public health purposes for the two-year period a total of \$22,600 or approximately \$11,300 per annum.

The money available to the State for general purposes is approximately \$2,500,000 for a 12-month's period. Computing the amounts that should be spent for the preservation of the public health on the two per cent basis there would result the sum of \$50,000, which

would not be sufficient to support an adequate State health department including a district health organization. The former requires not less than \$25,000 and the later \$36,000.

As far as the districts are concerned it is believed that the counties can well afford to assume the expense. Property in the counties is assessed at but 33 per cent of its actual valuation and the tax levy has not nearly reached its maximum. Thirty-six thousand dollars, a sufficient amount to support six districts, when divided among 52 counties, would be a small sum. In time the revenues of the State will have so increased that the expense of the districts can be defrayed out of State funds.

For the present the State should appropriate \$25,000 for its State health department, it being assumed that such department will then perform the functions now being performed by the several State bodies, as, for instance, the laboratory work, hotel inspection, and antituberculosis work, in addition to other duties now not attempted. The sum represents but a little over twice as much as is now being spent by the several State bodies engaged in public health work. It might be allotted at the discretion of the board of health as follows:

| | |
|---|---------|
| Secretary, not less than..... | \$3,000 |
| Epidemiologist, not less than..... | 2,500 |
| Sanitary engineer, not less than..... | 2,000 |
| Bacteriologist, not less than..... | 1,500 |
| 2 assistant bacteriologists, at \$1,200..... | 2,400 |
| 2 clerks, at \$840..... | 1,680 |
| 1 clerk, at \$720..... | 720 |
| Maintenance of laboratory..... | 4,000 |
| Traveling expenses, maintenance of office, etc..... | 7,200 |
| Total..... | 25,000 |

RECOMMENDATIONS.

As a result of a careful study of public health administration in North Dakota it may be concluded that there is a great lack of organization and funds with which to carry on public health work. Such health measures as have been enacted are more or less scattered among different branches of the government, whereas all these measures should be coordinated and their enforcement imposed on a single State health organization. In order to bring about this condition the following recommendations are made:

1. That all public health activities now being performed by the State board of health and the public health laboratory, as well as the public health activities now being performed by other Government agencies, be brought together in a department of health.

2. That the department of health be divided into a board of health, the office of the secretary, a bureau of communicable diseases, a bureau of public health engineering, and a bureau of "vital statistics."

3. That the board of health be composed of five members to hold office for five years and that the method of their appointment be so arranged that there will be but one new appointment each year.

4. That the secretary of the State board of health be appointed by the board as State health officer; that he be a full-time official prohibited from engaging in the practice of medicine or any other business that will interfere with his official duties; that he hold office during efficiency and subject to discharge for cause only by the board of health, and that he receive a salary of not less than \$3,000 per year and necessary traveling expenses.

5. That a full-time chief, an epidemiologist, be placed at the head of the bureau of communicable diseases.

6. That a full-time chief, a sanitary engineer, be placed at the head of the bureau of public health engineering.

7. That a full-time chief be placed over the bureau of statistics.

8. That the control of the public health laboratory be transferred from the University of North Dakota to the State department of health.

9. That the work of the laboratory be divided into two parts, that relating to the diagnosis of disease being under the control of the epidemiologist, and that relating to sewage and water analyses being under the control of the sanitary engineer.

10. That a bacteriologist be employed to carry on the laboratory work.

11. That the duties of the epidemiologist be to have charge of the collection and disposition of morbidity reports, to keep currently informed regarding the prevalence and geographic distribution of controllable diseases throughout the State, to supervise the preventive measures of the department for the control of disease, and to supervise the work of district and other health officers.

12. That the sanitary engineer be given supervisory and advisory control over water supplies, sewerage systems, and the disposal of garbage and trade wastes throughout the State.

13. That the hotel inspector be transferred to the health department to perform, in addition to hotel inspection, such other sanitary inspections or investigations as may be directed by the secretary of the State board of health.

14. That special attention be paid by the secretary of the State board of health to the dissemination of information on matters relating to the public health through the medium of popular bulletins, lectures, and exhibits.

15. That the State be divided into not less than six districts, each district to be composed of one or more counties at the discretion of the State board of health.

16. That a physician trained in the science of public health be appointed by the State board of health for each district as district health officer and given an office and adequate number of assistants, including an inspector, nurses, and a clerk. No one should be appointed until he has passed a thorough examination before the State department of health and has otherwise proved himself capable of filling the position. He should first receive a probationary appointment, and he should be prohibited from engaging in any private business which would interfere with his official duties. He should hold office during efficiency and good behavior and receive an adequate salary, which, as he proves himself capable, should be increased at definite intervals until it has reached a maximum which, in the judgment of the department of health, is sufficient. He should be allowed actual and necessary expenses when traveling on official business.

17. That the district health officer be made responsible to the State department of health for the enforcement of State health laws and regulations, and, under the State department of health, have supervisory and advisory control over county, city, and town health officials.

18. That the powers and duties of the district health officer be defined by law and include the enforcement of the law regarding the notification of cases of disease; the inspection of dairies, canneries, industrial camps, and all places of business or manufacture within his jurisdiction; the inspection of county schools and school children; the investigation of cases of illness and the institution of measures for the control of disease; the investigation of nuisances and the abatement of same; the keeping of complete records of transactions and the forwarding of all necessary reports to the State department of health; the dissemination of sanitary information in his district; the enforcement of the laws relating to the registration of births and deaths, and the performance of all other duties that may be required of him by the State department of health.

19. That the field organization be mobile, so that the district health officers, or their assistants, could be concentrated in any part of the State or in any city within the State in case of emergency, or their transfer from one district to another effected in the interest of the public service.

20. That the county and city organizations remain as they are, but that all local officials perform their duties under the supervision of the district health officer.

21. That the clerical personnel of the department of health be increased so as to adequately perform all the duties imposed upon it.

22. That the entire personnel of the department of health, except the members of the board, be "full-time" employees.

23. That a comprehensive law be enacted making it compulsory on the part of all persons interested to have plans for proposed installations of water supplies, sewerage, and refuse-disposal systems, approved by the State department of health. That the State department of health be empowered to require any changes or extensions in already existing installations that may be necessary to insure safe water supplies or proper sewage or refuse-disposal systems; or to order the installation of water-supply and sewerage or refuse-disposal systems in the absence of same. That the State department of health have the power to close, or to prevent the use of water from, any well, spring, or other source that in its opinion is dangerous to health, or to require the filling or draining of places where there is any accumulation of water, breeding of mosquitoes, or other condition dangerous to health.

24. That the model law for morbidity reports with necessary modifications be enacted.

25. That a law be enacted giving power to the State department of health to organize a system of health supervision of schools and school children in rural schools, and to supervise such work performed by cities.

26. That provision be made by law for calling a conference of district and other health officers annually, or oftener, by the State health officer, the expenses so incurred to be paid by the State, county, or local authorities.

27. That all plans of public buildings be submitted to the State department of health for approval as to sanitary arrangements.

28. That quarters large enough to accommodate the different divisions, as contemplated in this report, be furnished for the State department of health at Bismarek.

29. That provision be made for the free distribution of diphtheria antitoxin throughout the State.

30. That the methods of keeping accounts be such as to allow an accurate determination of the exact cost of any bureau or division or any special work at any time.



PRESENTED BY
PROF. G. H. F. RUTTALL

UNITED STATES PUBLIC HEALTH SERVICE
RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION
IN NEVADA

BY

CARROLL FOX

*Surgeon
United States Public Health Service*

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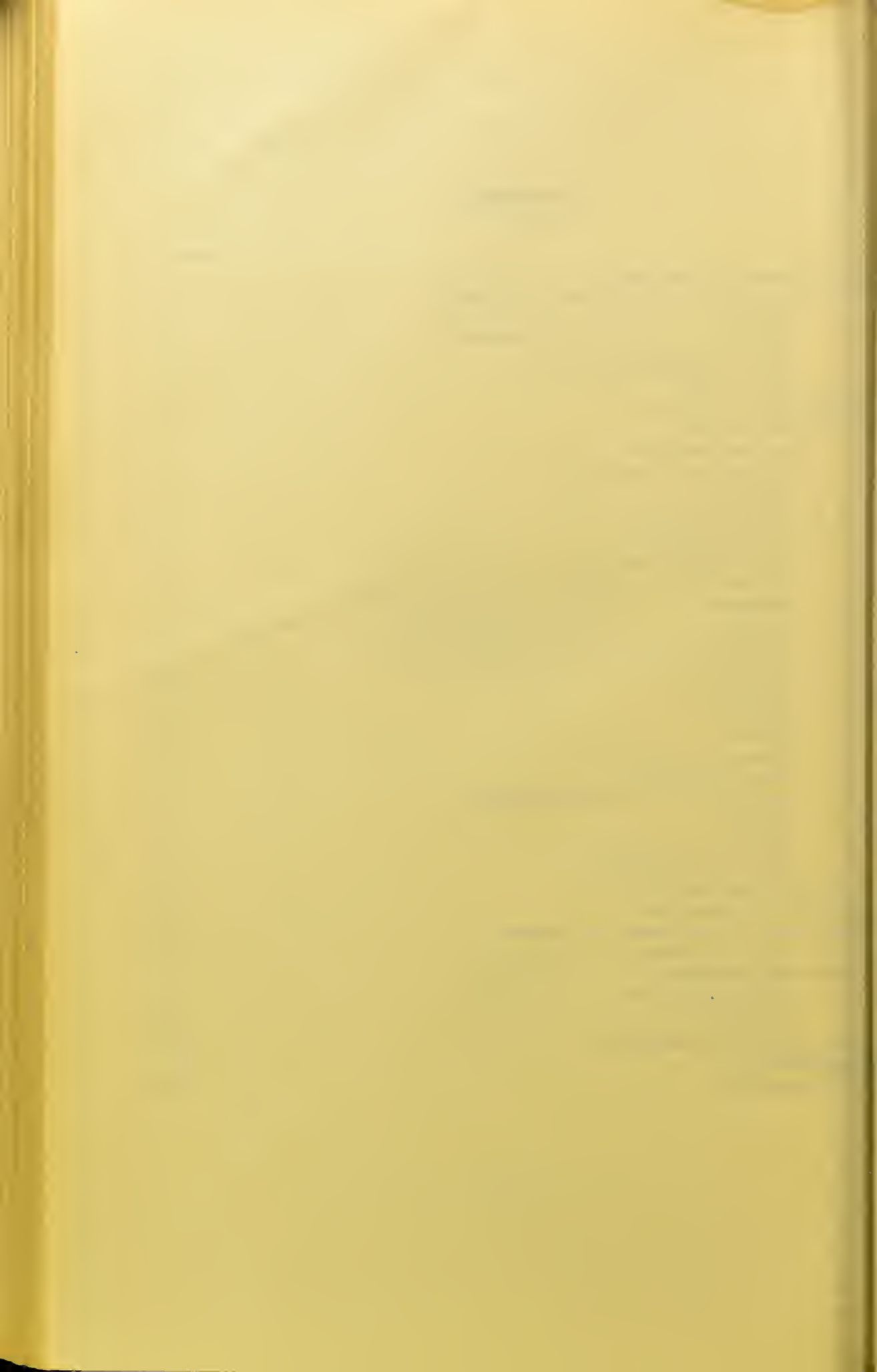


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PUBLIC HEALTH ADMINISTRATION IN NEVADA.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report contains the results of a study of public health administration and organization in the State of Nevada, carried on through a period of six weeks.

During the course of the investigation eight towns, representing seven counties, were visited, namely, Reno and Sparks in Washoe County; Elko, Elko County; Winnemucca, Humboldt County; Goldfield, Esmeralda County; Tonopah, Nye County; Carson City, Ormsby County; and Virginia City, Storey County.

Nevada is a State having an area of 109,821 square miles. Much of this vast territory is semiarid except in small areas, here and there, which have been brought under irrigation.

The chief industries of the State are, first, mining; second, cattle and sheep raising; and third, agricultural pursuits in the irrigated districts and some dry farming.

Notwithstanding its immense area, the State had a population in 1910 of but 81,875, and it is somewhat questionable whether there has been any very marked increase since then. It must be remembered that mining towns are subject to vicissitudes that change the prosperous community of to-day into the deserted village of to-morrow. Increased immigration into a new section frequently means emigration from an old section. No State census has been taken, and information obtained locally is purely a guess. The new International Year Book for 1915 gives Nevada a population of 98,726 as of July 1, 1915. This is an estimate based on the increase for the previous 10 years. It is believed to be too high. At any rate, in computing death rates, etc., in the following report the population of 1910 is used.

There are no large cities in the State. Reno is the largest, with a population of approximately 11,000. All of the principal communities have railroad communication, but, the State being a country of magnificent distances, to reach certain points may require one or two days.

For information and assistance received in this study the writer is indebted to the secretary and members of the State board of health, the local health officers, and other State and county officials.

ADMINISTRATION AND ORGANIZATION.

As early as 1893 a law was enacted creating a State board of health and giving it rather comprehensive powers and duties of a public health nature, including the authority to promulgate and

¹ Reprint from the Public Health Reports, vol. 30, No. 53, Dec. 31, 1915, pp. 3802-3823.

enforce regulations and providing a penalty for any violation thereof. Under this act the board of health, apparently not realizing the extent of the powers vested in it and being greatly handicapped by a totally inadequate appropriation, accomplished little except of a purely emergency nature.

In 1911 a vital statistics law was enacted. This law was patterned after the model law, but in addition provided for the creation of a State board of health along the lines of the law of 1893 and specified that such board was supreme in matters relating to the public health. This was followed in 1915 by an amendment making certain diseases reportable and requiring that physicians maintain quarantine.

After the passage of this amendment the board of health, in July, 1915, promulgated its first comprehensive regulations for the suppression of disease.

Composition and appointment of the board.—The board of health is composed of a president, a secretary, and one other member.

The president and secretary are appointed by the governor for a term of four years. Before being eligible for such appointment they must have been engaged in the regular practice of medicine in the State of Nevada for at least five years. This requirement does not apply to the third member of the board who is appointed by the governor, the president, and the secretary.

Meetings.—The State board of health is required to meet in Carson City on the first Tuesday in January and the first Tuesday in July of each year and at such other times as the president may deem advisable.

Duties and compensation of the members.—The president is required to preside over all meetings of the board and to perform such other duties as may be determined by the board. He receives a per diem of \$20 for each day the board remains in session and necessary traveling expenses.

The secretary is required to keep the minutes of all meetings of the board and to attend to all correspondence; to proceed immediately to any locality when called upon by the local health officer for the purpose of eradicating and preventing the recurrence of any epidemic; to investigate epidemics when called upon by the State board of health; to record and tabulate all vital statistics and to issue semiannual bulletins; to make a biennial report to the governor and to compile the reports received from the various health officers.

The secretary receives a salary of \$1,500 per year and is allowed the sum of \$300 a year for a stenographer and a sum not to exceed \$100 a year with which to provide a suitable office for the conduct of the affairs of the State board of health.

The third member of the board is required to attend all meetings of the board and to consult and advise with the board whenever

called upon to do so. He receives a per diem of \$20 for each day's attendance at a meeting and necessary traveling expenses.

Powers and duties of the board.—The State board of health is declared under the statute to be supreme in all health matters, and it is empowered to remove any deputy or local health officer for any violation of the provisions of law. It is further empowered to "take cognizance of the interests of life and health among the inhabitants of the State"; to "make or cause to be made sanitary investigations and inquiries respecting causes of disease, especially of epidemic and contagious diseases and the means of prevention; to investigate the sources of mortality and the effect of localities, employment, habits, and circumstances of life on the public health." The board is further empowered, upon request or when in its opinion the sanitary interests of the locality require it, to "advise with municipal, county, and township officers with regard to the location, drainage, water supply, heating and ventilation of public buildings, and the drainage and sewerage of towns and cities."

The board of health is likewise given the authority to promulgate and to enforce such regulations for the better preservation of the public health in contagious and epidemic diseases as it may judge necessary.

For refusing or neglecting to comply with any regulation of the board within 5 days after having received notice in writing, there is provided a fine of not less than \$100 nor more than \$500, or imprisonment for not less than 50 days nor more than 250 days.

It is made a duty of sheriffs, constables, and all peace officers to assist the board of health in enforcing the law and all rules, regulations, and requirements promulgated by the board.

Under the law every incoming governor has the power to change the composition of the entire board, including the secretary. Experience has shown that effective public health work can not be carried on by untrained men, and it is not conducive to efficiency to supplant at one time all of the experienced men by others who will in all probability lack that qualification. This statement applies most emphatically to the secretary, who should receive his appointment from the board of health and whose tenure of office should be based on efficiency and not political expediency.

The secretary.—The present secretary of the board is to all intents and purposes a full-time health officer, as he has given up practically his entire private practice. His salary is \$1,500 per annum, and because he performs his own stenographic work and his private office is the official office of the board of health he is permitted to retain the small fund allowed by law for stenographic services and office rent. There are not sufficient funds to employ capable assistants in either the office or the field, and when the manifold duties of a health department are vested in one man their accomplishment is difficult or impossible.

EPIDEMIOLOGICAL ACTIVITIES.

Morbidity Reports.

Requirements of law.—The provisions of law requiring the notification of diseases are summarized as follows:

It is made the duty of the attending physician to report to the local health officer every case of scarlet fever, smallpox, diphtheria and membranous croup, typhus fever, typhoid fever, whooping cough, measles, chicken-pox, pneumonia, tuberculosis, bronchitis, acute anterior poliomyelitis, cerebrospinal meningitis, diarrheal diseases of children, cancer, puerperal septicemia, mumps, and Rocky Mountain (tick) fever.

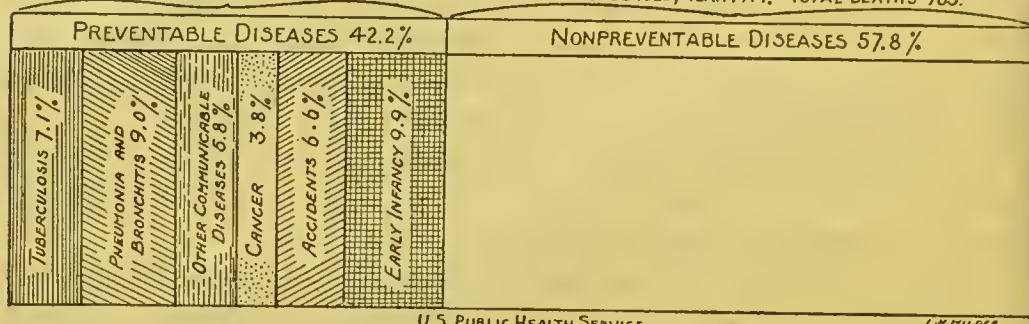
For failure so to report there is provided a fine of not less than \$100 nor more than \$500, or imprisonment for not less than 10 days nor more than 30 days, or both fine and imprisonment.

Requirements of regulations.—Acting on the above provision of law and other powers conferred upon it, the State board of health promulgated in July, 1915, certain regulations, of which the following is a summary:

It is the duty of the attending physician immediately to report to the local health officer all of those diseases mentioned in the law as reportable.

It is the duty of the local health officer daily to transcribe into the "Register of reportable diseases" all of the data furnished by the attending physician, as well

SHOWING THE PERCENTAGE OF DEATHS FROM PREVENTABLE DISEASES, YEAR 1914. TOTAL DEATHS 963.



U.S. PUBLIC HEALTH SERVICE

L. W. HILGER.

as certain information relating to the date of placarding, the date of the establishment of quarantine, the date of release of quarantine, the date of finding the first and second consecutive negative culture, the date of disinfection, etc.

The local health officer is required to transmit monthly to the secretary of the State board of health the original morbidity reports received by him during the previous month.

Discussion.—Previous to the passage of the above law and regulation, physicians had been submitting to the county health officers monthly statements of the communicable diseases under their care, and county health officers had been submitting to the State health officer monthly summaries of the cases of, and deaths from, the communicable diseases occurring in the county during the previous month. These reports were greatly lacking in important information.

The present law is faulty in that it does not require householders or heads of families to report diseases. The entire responsibility is placed on the physician. The law also neglects to state the time limit for reporting diseases. This has been provided for by regulation.

While the present law is not ideal, it is a great improvement over the old system, and its enforcement should result in securing more complete information regarding the prevalence of disease.

One of the most prevalent and fatal diseases occurring within the State is pneumonia. During the 12-month period ended June 30, 1915, it was reported from every county, there having been a total of 315 cases notified, with 69 deaths, for the entire State. This gives a death rate per 100,000 of 84.3 and a case fatality rate of 22 per cent. Of scarlet fever there were 185 cases reported, with 2 deaths, or a death rate per 100,000 of 2.44 and a case fatality rate of 1.08 per cent. There were 190 cases of typhoid fever reported, with 10 deaths, or a death rate per 100,000 of 12.2 and a case fatality rate of 5.26 per cent. The number of reported cases of diarrheal diseases of children was for the same period 481, with 27 deaths, or a death rate for 100,000 of 33 and a case fatality rate of 5.6 per cent. There were 10 cases of Rocky Mountain fever, with 4 deaths.

A study of the morbidity reports would justify one in concluding that, except for some of the minor communicable diseases, notifiable diseases were being reported fairly well. A notable exception, however, is diphtheria. During the first six months of the period under consideration there were but 2 cases reported, with 1 death, and during the last six months not a case was reported, although an examination of the records of the hygienic laboratory for the same months shows that there were 9 positive cultures examined. Were the laboratory a part of the health department and therefore in close touch with all of the activities of that department, the records of one could be made equally valuable to the other.

The Control of Disease.

Requirements of law.—The following is a summary of the law providing for the establishment and maintenance of quarantine:

It is made the duty of every physician attending a case of scarlet fever, smallpox, diphtheria, and membranous croup, whooping cough, measles, chicken-pox, acute anterior poliomyelitis, cerebrospinal meningitis, diarrheal disease of children, puerperal septicemia, or mumps, forthwith to establish and maintain a quarantine in conformity with the regulations promulgated by the State board of health.

Any physician who fails to establish and maintain such quarantine is liable to a fine of not less than \$25 nor more than \$100, or imprisonment for not less than 10 days nor more than 100 days, or by both fine and imprisonment.

Requirements of regulations.—In conformity with the above law, the State board of health at the meeting held July, 1915, promulgated certain regulations, of which the following is a summary:

For purposes of control the notifiable diseases are classified as follows:
To be quarantined:

Scarlet fever.

Diphtheria and membranous croup.

Smallpox.

To be quarantined—Continued.

Anterior poliomyelitis.

Cerebrospinal meningitis.

To be placarded:

Typhoid fever.

Diarrhea of children.

Chicken-pox.

Whooping cough.

Mumps.

Measles.

Reportable only:

Pneumonia.

Tuberculosis.

Bronchitis.

Typhus fever.

Rocky Mountain (tick) fever.

Puerperal septicemia.

Cancer.

It is made a duty of the attending physician in whose practice a case of communicable disease has occurred to instruct the family as to how the spread of the disease may be prevented and to furnish a copy of the rules and regulations of the State board of health governing quarantine.

Quarantine is established by serving a written notice, signed by the local health officer, upon the head of the household and placarding the house with a card bearing the word "Quarantine" and a statement to the effect that persons are forbidden to enter or leave the premises.

It is made a duty of the attending physician, when delegated by the local health officer, to establish and maintain quarantine by serving the notice and placarding the house.

Notices are served in duplicate, the original being left with the householder and the duplicate being returned to the local health officer, signed by the person serving the notice, who is also required to indorse thereon certain data relative to the date and hour served, etc.

All pet animals must be excluded from rooms occupied by infected persons in quarantine. Upon the completion of quarantine it is required that all rooms occupied by infected persons and all bedding, clothing, or other articles contained therein be disinfected.

It is made a duty of the attending physician, when delegated by the local health officer, to perform the necessary disinfection.

No letters or other articles may be mailed without permission from the local health officer. Provision is made for disinfecting such letters before mailing.

No person is permitted to enter or leave premises under quarantine except as specially provided for by the rules and regulations.

Adults and children who have previously had the disease may be permitted to leave quarantined premises, but may not reenter until the quarantine is raised, except in the case of smallpox, when no unvaccinated person may be released before the end of the quarantine, and in the case of diphtheria, when no person in whose throat virulent bacilli are found may be released before the end of the quarantine period.

Where possible, persons suffering from a quarantinable or placardable disease should be rigidly isolated, in a suitable room, from other members of the household, and all dishes, bedding, and the like and the secretions from the patient's throat and nose must be disinfected before being removed. Where the conditions are such as to render the taking of proper precautions difficult or uncertain, the local health officer may apply to the local board of health for an order to remove the patient to the isolation ward of the county hospital.

The sale of milk or dairy products from quarantined or placarded premises is prohibited, unless in the opinion of the local health officer the conditions are such that the products can be kept free from contamination.

Wage earners may be permitted to attend to their usual vocation when they are protected by either a natural or acquired immunity or, in the case of diphtheria, when a negative culture has been obtained from the nose and throat: *Provided*, That the patient is properly isolated, that proper precautions are taken to change the clothes when entering and leaving the house, and that the wage earner is not engaged in any business which brings him in contact with children.

Scarlet fever.—Quarantine must be maintained until the complete recovery of the patient, including recovery from all sequelæ of the disease.

If the disease terminates in death or the patient be removed from the premises, the quarantine may be released, except that where there are susceptible children present, it must be maintained for 5 days following the death or removal. Under no circumstances may quarantine be released until after the disinfection of the patient and room.

Diphtheria.—Quarantine must be maintained until two successive negative cultures from the nose and throat, taken not less than 24 hours apart, are reported to the local health officer from the hygienic laboratory.

If the bacilli persist in the throat or nose after a period of 28 days a virulence test may be made. The presence of a nonvirulent organism is considered equivalent to a negative culture.

Where the cultural method for the release of quarantine is not used, quarantine must be maintained for 28 days from the beginning of the last case on the premises.

If the disease terminates in death or the patient is removed from the premises, the quarantine may be released except where there are susceptible children present, when it must be maintained for 7 days longer. However, if the children have recently received immunizing doses of antitoxin and one negative culture has been obtained from the nose and throat, quarantine may then be raised.

In no case may quarantine be raised until the proper disinfection has been performed.

Smallpox.—Quarantine must be maintained until the complete recovery of the patient as determined by the disappearance of all crusts.

Contacts may be released after disinfection if they have had smallpox or if they have been successfully vaccinated within 3 years.

In no case may quarantine be raised until the proper disinfection has been performed.

If the disease terminates in death or the patient is removed, quarantine must then be maintained for 2 weeks from the date of death or removal.

Cerebrospinal meningitis and anterior poliomyelitis.—Quarantine must be maintained until the recovery of the patient from the acute symptoms.

Where the disease terminates in death or the removal of the patient, quarantine may be released after 10 days from date of death or removal.

In no case may quarantine be raised until the completion of the required disinfection.

Disinfection.—The regulations go into detail as to the kind of disinfectant and the methods of application.

For the disinfection of the body a 2 per cent solution of carbolic acid or a 1 to 3,000 solution of bichloride of mercury is required.

For room disinfection it is required to use for every 1,000 cubic feet:

| | Ounces. |
|---|---------|
| Formalin (40 per cent formaldehyde)..... | 11 |
| Water..... | 11 |
| Potassium permanganate (fine crystals)..... | 9 |

Placarding.—By placarding is meant posting on the infected premises a card containing the word "Warning" and a statement that persons may not enter the premises.

It is the duty of the local health officer to placard, or he may delegate the physician or any peace officer to do the same.

Persons under the age of 21 living in a house where there is a case of chicken-pox, measles, or whooping cough are prohibited from attending any school, church, Sunday school, or public gathering of any sort.

Chicken-pox.—Local health officers must satisfy themselves that a mild case of small-pox has not been erroneously diagnosed chicken-pox.

Placards must remain on the house until 21 days from the date of onset of the last case on the premises.

Measles.—If there are other susceptible persons on the premises, the placard must remain posted for 3 weeks from the date of onset of the last case on the premises. If not, placards may be removed at the end of 2 weeks from the date of onset.

Mumps.—The placard must remain posted on the premises for 3 weeks from the date of onset of the last case.

Whooping cough.—The placard must remain posted on the premises for 6 weeks from the date of onset of the last case.

Typhoid fever and diarrhea of infants.—The placard must remain posted until complete recovery of the patient.

It is made a duty of the attending physician to instruct the nurse or attendant to disinfect the feces and urine by mixing a cupful of chloride of lime with each passage and allowing the disinfectant to stand in contact with the excreta for one hour before being disposed of.

If in the opinion of the local health officer the discharge of the above duty is difficult or unsatisfactory, he is required to apply to the county board of health for an order to remove the patient to the isolation ward of the county hospital.

Discussion.—These regulations have been in effect such a short time that it is impossible to state what practical results may have accrued from their enforcement. However, they will certainly make quarantine procedure uniform throughout the State, a thing greatly to be desired.

On account of peculiar local conditions the responsibility of establishing and maintaining quarantine and giving the necessary instructions to prevent the spread of the disease has been to a large extent placed with the attending physician. Until more efficient local health departments can be secured this is probably a wise provision. However, one must not expect too much from the best regulations unless they are enforced by a skilled health officer with the invaluable assistance of his epidemiologist and public health nurse.

It is thought that in the regulations too much stress is laid upon the necessity for terminal fumigation as compared with the more important disinfection of discharges during the course of the disease.

It is also thought that the penalties imposed against the physicians are rather great and that there should be a penalty provided for any person who violates any provision of the regulations.

Rabies.—Rabies is becoming a serious menace to the people of some sections of the State of Nevada. It is supposed to have been introduced from Idaho, where some one, believing that the coyote

could be exterminated by inoculating with rabies virus, attempted the experiment, with the result that the disease has spread over several States. Dogs and a number of persons have been bitten.

The State board of health of Nevada, appreciating the danger, recommended to the municipalities in the presumably infected zone that all dogs be muzzled. The towns passed the necessary ordinance, and it was satisfying to note that in Winnemucca and Elko the ordinance was being enforced. The State board of health has requested the cooperation of the biological survey, which has promised to place a hunter in the field.

The Pasteur treatment is administered at the hygienic laboratory of the university, antirabic virus being obtained from the United States Public Health Service.

The common drinking cup, etc.—In addition to the regulations summarized above the State board of health has promulgated regulations abolishing the common drinking cup and common towel on vehicles of common carriers in intrastate traffic and also providing for the cleanliness and purity of ice and water used on such vehicles.

THE HYGIENIC LABORATORY.

The hygienic laboratory was established in 1909 by legislative enactment to aid physicians and health officers in the diagnosis of "infectious" diseases and for research into the nature, cause, and control of such diseases.

Since its inception, the laboratory, in addition to assisting in the diagnosis of communicable diseases, has made bacteriological examinations of milk and water as well as sanitary surveys in connection with town water supplies, and has carried on epidemiological studies in the case of typhoid fever, dysentery, and other diseases. The laboratory has, in fact, been assuming the functions of a health department, and yet for purposes of administration it was placed under the control of the regents of the University of Nevada instead of being made a part of the State board of health, to which it logically belongs.

There is by accident, so to speak, a remote connection between the laboratory and the board of health, inasmuch as the bacteriologist of the laboratory was appointed third member of the board.

The laboratory is under the immediate direction of a veterinarian, the professor of veterinary bacteriology at the university. He receives, in addition to his regular salary, \$600 from the laboratory fund. There is also employed a full-time bacteriologist, who receives \$2,400 per year and upon whom falls the actual work of the bacteriological examinations, as well as of the field investigations. There is one laboratory attendant employed. To defray the expenses of the laboratory there is appropriated \$5,000 per year.

During the last year and a half the work of the laboratory has greatly increased, there having been made 777 examinations in 1914, representing a cost per examination of \$6.43. This is a marked improvement over previous years, as in 1913 there were made 386 examinations, at a cost per examination of \$12.95, and in 1912 but 276 examinations, at a cost per examination of \$18.11. During the first half of the present year (1915) there were made 1,147 examinations, representing a cost per examination of but \$2.17. Thus with the completion of the year 1915 the cost per examination will approximate a figure more consistent with economical maintenance.

Previous to 1914 the official work of the laboratory was confined almost entirely to the diagnosis of typhoid fever, tuberculosis, diphtheria, and malaria, with the occasional examination of samples of milk and water. Since that time its scope has been greatly increased and made to include Wasserman reactions, examinations of pus, blood, etc., the manufacture of typhoid and autogenous vaccines, and in fact many other laboratory facilities have been extended to the practicing physicians and health officers, all of which explains the increasing desire on the part of physicians to avail themselves of the opportunities offered.

The laboratory furnishes outfits for the submission of samples for examination and reports to physicians the results of such examinations by telephone or telegraph when requested or practicable, as well as by regular report cards, keeping a proper file for future reference.

From the standpoint of the public health the hygienic laboratory can never be of the greatest value to the State until it is made a part of a properly organized health department. It is to be hoped, therefore, that the next legislature will desire to see its State health organization strengthened so that it will be, though small, at least equal in efficiency to that of other States and capable of acting along modern lines. A reorganization with this end in view would mean the formation of a State health department and a transfer of that most necessary and important adjunct, the laboratory and its equipment, from the control of the board of regents of the university to the control of the board of health of the State department of health.

It is hopeless to expect to eradicate the preventable diseases, the control of which is the entire function of a health department, until all of the forces engaged are correlated and placed under one controlling head.

PUBLIC HEALTH ENGINEERING.

Activities along this line of public health have been sadly neglected in Nevada, principally because the State board of health has never had sufficient funds to employ the necessary expert assistants to carry on the work.

There is indeed little law governing public or private water supplies used for domestic purposes or controlling sewerage systems, although the board of health is empowered to advise with local authorities in regard to the drainage and sewerage of towns and cities and could, under the provisions of law empowering it to investigate the causes of disease, make the necessary surveys of water supplies.

An effort has been made on the part of the hygienic laboratory to carry on sanitary surveys of water supplies, but without the services of a sanitary engineer the results obtained are not likely to be entirely satisfactory.

In a recent inspection made by the writer of several towns in the State the great need for sound advice in connection with local sewerage systems was most apparent. There was hardly a town inspected that did not have its sewerage problem, in the solution of which a sanitary engineer from the State health department would have been of the greatest assistance at no expense to the locality. In fact, the advisory and supervisory assistance that such a State official would be able to give would frequently result in a great saving of money to the community.

Every town visited was sewered. In two instances the sewage was passed into a river untreated. In two instances the sewage flowed into a river after passing through a septic tank. In neither instance did the septic tank seem to be carrying out its function properly. In three instances the sewage passed into the sands of the desert—apparently a more or less satisfactory method of disposal. In one instance the sewage was used for irrigating.

In general it may be said that the water supplies of the different communities are comparatively pure. They are all owned by private corporations. A proper supervision over these supplies so that their purity may be maintained should be exercised by the State board of health. This matter is easy to control at the present time while the population is sparse, but as irrigation projects are completed and the rural population of a permanent nature increases, the water and-sewerage problems will become much more difficult to handle.

The methods used for the collection and disposal of garbage in the different communities are primitive and would bear investigation by a State sanitary engineer.

There is a State law which provides for the abatement of nuisances in unincorporated towns. It is summarized as follows:

For the purposes of the act, nuisances are deemed to consist of permitting filth heaps, garbage, unprotected sewerage or drainage pipes or boxes, cesspools, etc., and such other nuisances as may be specified by the State or county board of health, to remain unabated after due notice has been given to abate or remove the same.

The law further states the methods of procedure in order to secure the abatement of a nuisance, and in the event of an order not being obeyed authorizes the local authorities to abate the nuisance and charge the cost as a lien against the property.

REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES.

The registration of births and deaths is carried out under the provisions of an act passed in 1911. As this act conforms closely to the model law proposed by the Bureau of the Census, it is not thought necessary to summarize it here.

The State health officer is State registrar of births and deaths, and the county health officers are local registrars. The local registrars regard the practicing physicians of the county as deputy registrars, but few have officially received the appointment as such, and these would, therefore, not be entitled to any fees allowed by law.

To expedite the business of registration and increase the returns it would seem advisable to appoint a number of deputy registrars for each county.

During the year 1914 there were registered 963 deaths (exclusive of stillbirths), which gives a death rate for the State of 11.7.

It is generally believed by local registrars that practically all of the deaths are certified, that the practicing physicians are conscientious in fulfilling this obligation to the State, and that a death, even though it may occur far removed from the centers of population, is sooner or later brought to the attention of the registrar.

During the year 1914 there were 1,327 births registered, exclusive of stillbirths. This gives a birth rate of 16.2. This low birth rate is not inconsistent with local conditions. The conditions incident to mining camps are such that there is always a large preponderance of unmarried males comprising the population. It is quite unfair to compare either the birth or the death rate of a State like Nevada with the rates of more settled agricultural communities.

During the year 1914 there were registered 95 deaths in children under 1 year (exclusive of stillbirths), which, compared with 1,327 births for the same period, would give an infant mortality of 71.5.

Of the 963 deaths registered in 1914 fully 408, or 42.2 per cent, should be classed as preventable, and should therefore receive the attention of the health department.

Report of marriages.—There is a provision of law which requires that county clerks transmit to the secretary of the State board of health on or before the 10th day of January and the 10th day of June of each year the number of marriage licenses issued by them during the preceding six months.

*Tabulation of information relating to the registration of births, marriages, and deaths,
State of Nevada, 1914.*

| County. | Population | Area (square miles) | Number of registrars. | Number of deputy registrars. | Number of physicians. | Number of embalmers. | Number of birth certificates. ¹ | Number of death certificates. ¹ | Cost. | Number of marriages. | Stillbirths. |
|-----------------|------------|---------------------|-----------------------|------------------------------|-----------------------|----------------------|--|--|-------|----------------------|--------------|
| Churchill..... | 2,811 | 5,050 | 1 | 0 | 5 | 1 | 54 | 46 | ..... | 34 | 1 |
| Clark..... | 3,321 | 8,045 | 1 | 0 | 4 | 1 | 81 | 35 | ..... | 37 | 1 |
| Douglas..... | 1,895 | 733 | 1 | 0 | 5 | 0 | 44 | 11 | ..... | 19 | 1 |
| Elko..... | 8,133 | 17,059 | 1 | 0 | 8 | 2 | 161 | 87 | ..... | 65 | 2 |
| Esmeralda..... | 7,869 | 7,432 | 1 | 0 | 6 | 1 | 91 | 65 | ..... | 38 | 4 |
| Eureka..... | 1,830 | 4,157 | 1 | 0 | 1 | 1 | 27 | 17 | ..... | 8 | 1 |
| Humboldt..... | 6,825 | 15,857 | 1 | 1 | 12 | 3 | 103 | 54 | ..... | 54 | 3 |
| Lander..... | 1,786 | 5,721 | 1 | 0 | 2 | 1 | 23 | 23 | ..... | 7 | 0 |
| Lincoln..... | 3,489 | 10,511 | 1 | 0 | 4 | 1 | 47 | 30 | ..... | 0 | 1 |
| Lyon..... | 3,568 | 1,509 | 1 | 0 | 5 | 1 | 61 | 48 | ..... | 36 | 2 |
| Mineral..... | 1,500 | ..... | 1 | 0 | 5 | 1 | 11 | 19 | ..... | 17 | 0 |
| Nye..... | 7,513 | 18,294 | 1 | 1 | 9 | 4 | 121 | 78 | ..... | 88 | 1 |
| Ormsby..... | 3,415 | 156 | 1 | 0 | 6 | 4 | 33 | 51 | ..... | 38 | 1 |
| Storey..... | 3,045 | 251 | 1 | 0 | 1 | 1 | 33 | 50 | ..... | 12 | 0 |
| Washoe..... | 17,434 | 6,251 | 1 | 1 | 40 | 6 | 283 | 271 | ..... | 249 | 5 |
| White Pine..... | 7,441 | 8,795 | 1 | 0 | 8 | 2 | 154 | 78 | ..... | 76 | 6 |
| Total..... | 81,875 | 109,821 | 16 | 3 | 121 | 30 | 1,327 | 963 | ..... | 778 | 29 |

¹ Exclusive of stillbirths.

LOCAL HEALTH AUTHORITIES.

Requirements of law.—The requirements of law relating to the appointment of local boards of health and local health officers are summarized as follows:

The county board of health consists of the county physician, the sheriff, and the board of county commissioners. The county physician acts as chairman.

This board of health acts in conjunction with, and under the supervision of, the State board of health.

The duties of the county board of health are to "oversee all sanitary conditions" of the county and to "supervise, control, and enforce such health regulations as will best subserve the health and cleanliness" of the county.

In cases of emergency where immediate action is necessary the county board of health may act independently of the State board of health, reporting its action at once to that board.

For neglecting to comply with any regulations as contemplated above, within 5 days after receiving notice in writing, there is provided a fine of not less than \$50 nor more than \$200, or imprisonment for not less than 25 days nor more than 100 days, or both fine and imprisonment.

The board of county commissioners is required to appoint a county health officer to act for a period of not less than one year, who may be removed only for incompetency.

The duties of the county health officer are to act as local registrar and to record cases of the communicable diseases reported by physicians.

For collecting and compiling the vital statistics of the county the local registrar must be given by the county a salary of not less than \$25 per month.

With the approval of the county commissioners, the local health officer may appoint one or more deputy health officers, who are entitled to a salary of not less than \$25 per month or, in lieu of such, a fee of \$1 for each birth and death certificate executed by them.

Discussion.—There are 16 counties and in each county there is a county health officer, who receives a salary of from \$25 to \$50 per month for his services as county registrar, but no salary as health officer. Frequently the county health officer is also county physician and receives an additional compensation for his services in that capacity.

As health officer the duties are not onerous, and consist of the registration of births and deaths, the recording of morbidity reports, and in general a supervision of the communicable diseases. In a few instances the health officer attempts some supervision over the milk supply and in a small way some health supervision of schools.

In Reno, the largest city in the State, there has been created a board of health consisting of three members, each of whom has assumed certain duties. One is health officer, one secretary, and one milk inspector. In this way certain functions of a health department are carried out.

Few of the towns are incorporated. The county health officer usually acts as health officer for the county seat.

If the small population of the State were concentrated, one full-time health officer would be sufficient. It is not, however. It is divided into small but important and prosperous communities, which are scattered over an immense area.

Taking into consideration the public health needs of the State as a whole, its great size, transportation facilities, and the importance, prosperity, and location of its various centers of population, it would seem advisable to divide the State into not less than four districts, in each of which should be placed a full-time health officer to assume the responsibility of enforcing all public health laws and regulations within his district. Provisionally, the State might be divided as follows:

District No. 1:

Washoe County.
Storey County.
Ormsby County.
Lyon County.
Douglas County.
Mineral County.

District No. 2:

Humboldt County.
Churchill County.
Lander County.

District No. 3:

Elko County.
Eureka County.
White Pine County.

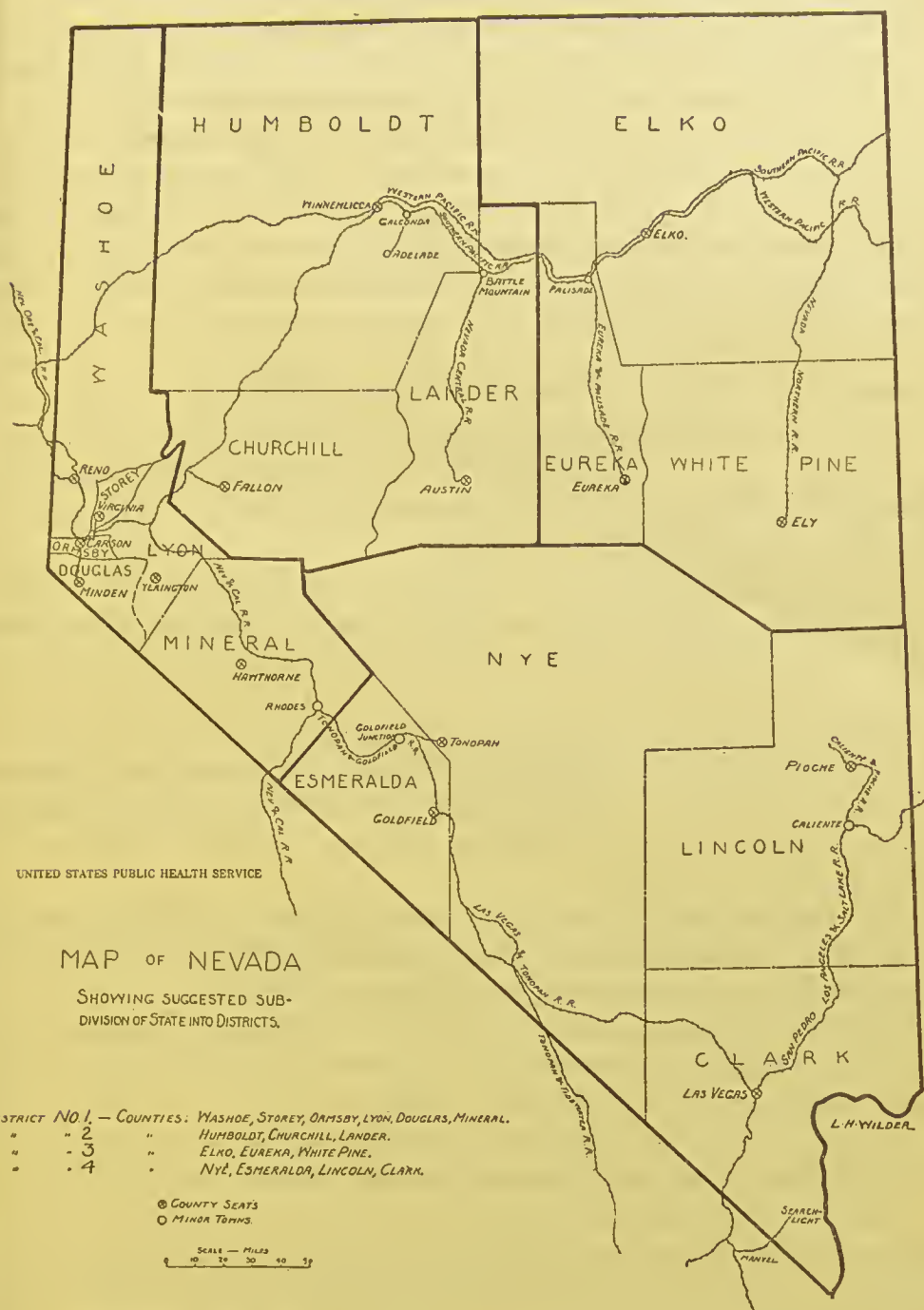
District No. 4:

Nye County.
Esmeralda County.
Lincoln County.
Clark County.

The salary and expenses of the district health officer could be paid by the different counties comprising the district without placing much of an extra financial burden on any one community.

For instance, at the end of the year 1914 Elko County had a balance, after all debts were paid, of approximately \$250,000, Hum-

boldt County a balance approximately of \$48,000, Nye County a balance of approximately \$90,000, Ormsby County a balance of approximately \$26,000, Storey County a balance of approximately



\$9,400, Washoe County a balance of approximately \$290,000, and White Pine County a balance of \$80,439.

County and deputy health officers would have to be appointed as under the present law, as well as a deputy health officer in each

town, who need not necessarily be a physician. They would act in their present capacity as local registrars and would assist the district health officer in emergencies and keep him informed of the conditions in and the needs of the locality.

In the course of time it would be advisable for the State to assume the whole, or at least part, of the expense of the district health organization. At present, taking into consideration the State's limited means, it is probably better that the expense be defrayed by the counties comprising the districts. This expense might also be paid in part by money from the school fund, for the reason that much of the time of the district health officer and his public-health nurse would be occupied in the health supervision of the public schools, especially the rural schools within the district.

THE CONTROL OF THE MILK SUPPLY.

The enforcement of State law and regulation relating to the purity of the milk supply has been placed in the hands of the State commissioner of food and drugs, whose division is in the public-service division of the University of Nevada.

The law specifies that it is unlawful to sell impure, adulterated, or unwholesome milk, and provides a fine for violation of not less than \$100, or, if the fine is not paid, imprisonment for not less than 30 days.

The law further specifies that milch cows must not be kept in a crowded or unhealthy condition and that they must not be fed on any food that produces impure, diseased, or unwholesome milk, and that milk that has any portion of its cream removed must not be sold except as skim milk.

It is also declared unlawful to add any water to milk or to feed milch cows on distillery waste or garbage. A fine is provided the same as above for any violation of this provision.

The food and drug commissioner has set a standard for milk which requires at least 3.25 per cent of milk fat, 11.75 per cent of total solids, and 8.5 per cent of solids not fat.

A circular has been issued to consumers telling them how to care for milk after it has been delivered by the dealer.

Producing farms are scored, using a score card similar to that in use by the United States Department of Agriculture.

There is but one inspector employed by the food and drug commissioner, who carries on all of the field work entailed in the enforcement of the food and drug law. A few municipalities, through their health officers, are making a special effort to improve the milk supply and with some success. However, most of the municipalities depend entirely upon the efforts of the food and drug commissioner.

As stated in previous reports, it is highly desirable that the sanitary control of milk supplies be placed in the hands of the State board of health. Municipal milk inspectors are practically always a part of the local health department and their work could be made much more effective if they acted in conjunction with the State health department, a body which should be in the position to give advice to, and supervise, the work of the local health organizations.

The sanitary control of the milk supply has two objects in view, the preservation of the purity of milk as such, as well as the purity of products made from milk, as for instance, butter and cheese. From the standpoint of the public health the former is the more important because of the frequent association of a contaminated milk supply with outbreaks of certain of the communicable diseases and the high mortality among infants. The prevention of deaths from this cause is, therefore, essentially a duty of the health department, which is authorized by the legislature to promulgate and enforce regulations for the better preservation of the public health.

It can not be successfully contended that because the statute has intrusted to a particular board the general supervision of the milk supply, by implication it has forbidden the State health department to take such action in regard to milk as may preserve the health of the people of the State. Such action would mean the promulgation and enforcement by the State board of health of regulations not in conflict with those already existing, thereby making it possible to work in close cooperation with such other State organizations as may be striving to secure better and cleaner milk.

APPROPRIATIONS.

The value of the total assessable property in the State for 1915 is estimated at \$152,000,000. The tax levy for 1915 is fixed at 56 cents on each \$100 of assessed valuation. This would give a revenue of approximately \$850,000. If to this amount there be added the sum of \$250,000, which is the income from liquor licenses, sundry receipts, etc., the total receipts of the State will be found to be \$1,100,000.

Out of this sum there is allowed for public health a total of \$8,250 per year, as follows:

| | |
|---|---------|
| The hygienic laboratory..... | \$5,000 |
| The salary of the secretary of the board of health..... | 1,500 |
| General expenses of the board of health..... | 1,750 |
| Total..... | 8,250 |

This figure represents but three-fourths of 1 per cent of the total receipts of the State, whereas, estimating the amount that should be appropriated annually to public health on the 2 per cent basis, there would be allowed not less than \$22,000.

It is thought possible to organize a State department of health for Nevada, capable of carrying on its functions satisfactorily for several years at least, without at present asking for a sum as large as that mentioned above, or \$22,000. It is suggested that for the present at least \$8,000 a year more than the present appropriation, or \$16,250, would enable the State to have a small but efficient State health organization.

The appropriation would then be divided about as follows:

| | |
|---|----------|
| Salary of— | |
| Secretary..... | \$2, 500 |
| Epidemiologist..... | 2, 400 |
| Sanitary engineer..... | 2, 000 |
| Bacteriologist..... | 1, 500 |
| One laboratory attendant..... | 600 |
| Two clerks, at \$900 each..... | 1, 800 |
| General expenses, including maintenance of laboratory, traveling expenses, stationery, etc..... | 5, 450 |
| Total..... | 16, 250 |

This figure represents less than $1\frac{1}{2}$ per cent of the total available revenues, and is extremely small when compared to the State aid to public schools, which amounts to \$247,000, or over 22 per cent, and the appropriations to the university, which amount to \$145,499 (exclusive of the public-service department), or over 13 per cent of the total available revenues.

RECOMMENDATIONS.

As a result of the study of health administration in the State and a careful consideration of the public health needs, one can but arrive at the conclusion that a well-organized department of health is necessary. This would mean a strengthening of the present board of health and a correlation of the various public health activities which are now being carried on by different State organizations. The present system in Nevada, as well as in many other States, results in making a plaything of the public health rather than a problem to be looked upon seriously.

In order that the necessary reorganization may be accomplished and the State board of health put in a position to conserve the health of the people the following recommendations are made:

1. That the number of members forming the State board of health be increased to five and that the term of office be five years and so arranged that there will be but one change each year.

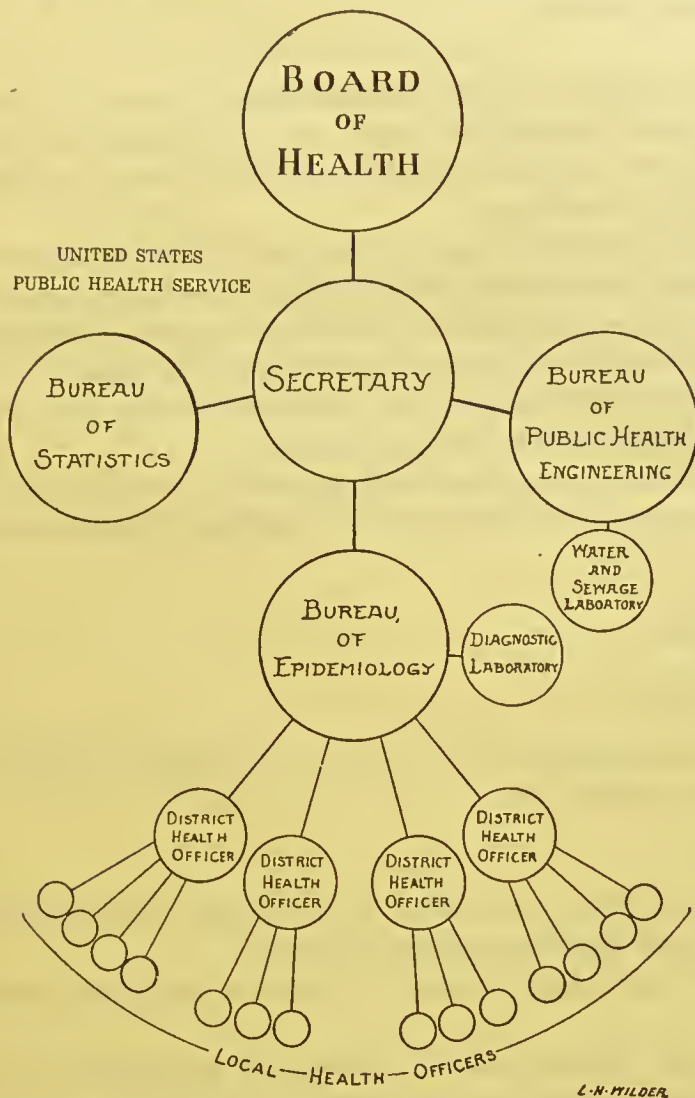
2. That the Secretary be appointed by the board of health to hold office during efficiency and to be discharged only for cause; that he be prohibited from engaging in the practice of medicine or any other business except that in connection with his official work.

3. That the name of the present State health organization be changed to the State department of health.

4. That the present hygienic laboratory and its equipment be transferred from the public-service division of the University of Nevada to the State department of health.

5. That the work of this laboratory be subdivided into two parts, namely, diagnostic and water and sewage.

SUGGESTED ORGANIZATION FOR A STATE DEPARTMENT OF HEALTH IN NEVADA.



6. That for purposes of administration the State department of health be subdivided as follows:

The board of health.

The executive office or office of the secretary.

The bureau of epidemiology.

The diagnostic laboratory division.

The bureau of sanitary engineering.

The water and sewage laboratory division.

The bureau of statistics.

7. That the secretary of the board of health be the State health officer, have general charge of the State health department, and act as chief of the bureau of statistics.

8. That additional officers and employes be employed in the State health department as follows:

One epidemiologist.
One sanitary engineer.
One bacteriologist.
One laboratory attendant.
Two clerks.

9. That the epidemiologist be chief of the bureau of epidemiology, and have general supervision over the epidemiological work of the department, the morbidity reports, the diagnostic laboratory, and the district health officers.

10. That the sanitary engineer be chief of the bureau of sanitary engineering and have general supervision over the water and sewage laboratory, and water supplies, sewerage systems, garbage-disposal systems, and disposal of trade wastes within the State.

11. That the bacteriologist be made responsible for the bacteriological work performed in the laboratory.

12. That there be appropriated annually a sum of not less than \$16,250 to be spent as follows at the discretion of the board of health:

| | |
|---|----------|
| Secretary..... | \$2, 500 |
| Epidemiologist..... | 2, 400 |
| Sanitary engineer..... | 2, 000 |
| Bacteriologist..... | 1, 500 |
| Laboratory attendant..... | 600 |
| Two clerks..... | 1, 800 |
| General expenses of the department, including the maintenance of the laboratory, traveling expenses, etc..... | 5, 450 |
| Total..... | 16, 250 |

13. That the State be divided into not less than four districts at the discretion of the State board of health.

14. That in each district there be placed a full-time district health officer.

15. That the district health officers be appointed by the State board of health and made responsible to the secretary of the State board of health; that they be graduate physicians; that they hold their office during efficiency and good behavior, and that they be prohibited from engaging in the private practice of medicine.

16. That they be held responsible for the enforcement of all health laws and regulations and be given general supervision over the work of local health officers, within their respective districts.

17. That the salary and office and traveling expenses of each district health officer and the salary of one public health nurse for each

district be paid proportionately by the counties comprising the district.

18. That the duties of the district health officers be defined by the State health department and include health supervision of schools, the sanitary control of the milk supply, supervision over the communicable diseases, enforcement of the law requiring the registration of births and deaths and the notification of preventable diseases, and dissemination of popular public health information and the like.

19. That the public health nurse perform such duties as may be assigned to her by the district health officer.

20. That county health officers be appointed as under the present law.

21. That more deputy health officers who need not necessarily be physicians be appointed.

22. That both county and deputy health officers, in addition to acting as local and deputy registrars, be regarded as assistants to the district health officers, to act and assist them in emergencies and to keep them informed of the conditions in and the needs of the locality.

23. That when practicable more efficient laws and regulations be enacted for the collection of morbidity reports, the control of disease, the control of water and sewerage systems, and the sanitary control of the milk supply by the State.



REPRINTS FROM THE PUBLIC HEALTH REPORTS FOR THE CALENDAR
YEAR 1915.

246. Tuberculosis—The Home Hospital Experiment. By Donald B. Armstrong. P. H. R., Jan. 1, 1915.
247. Sewage Disinfection—For Vessels and Railway Coaches. By Leslie C. Frank. P. H. R., Jan. 1, 1915.
248. Impounded Waters—Their Effect on the Prevalence of Malaria—Survey at Blewetts Falls. By H. R. Carter. P. H. R., Jan. 1, 1915.
249. The Spread of Tuberculosis—Report on the Spread of Infection in Certain Tuberculous Families in Five Counties in Minnesota. By H. G. Lampson. P. H. R., Jan. 8, 1915.
250. Sickness Insurance—Its Relation To Public Health and the Common Welfare. By B. S. Warren. P. H. R., Jan. 8, 1915.
251. Rocky Mountain Spotted Fever—A Report of Its Investigation and of Measures Undertaken for its Eradication During 1914. By L. D. Fricks. P. H. R., Jan. 15, 1915.
252. Public Health Administration In West Virginia—A Study of the Health Laws and Public Health Administration of the State of West Virginia. By Taliaferro Clark. P. H. R., Jan. 22, 1915.
253. Biological Products—Establishments Licensed for the Propagation and Sale of Viruses, Serums, Toxins, and Analogous Products. P. H. R., Jan. 22, 1915.
254. The Purity and Strength of Household Remedies—Variations in Purity and Strength of Widely Used Drugs and Preparations a Possible Source of Danger to the Patient. By Martin I. Wilbert. P. H. R., Jan. 29, 1915.
255. Public Health Administration in the State of Washington. By Carroll Fox. P. H. R., Feb. 5, 1915.
256. The Limitations to Self-Medication—Uses and Abuses of Proprietary Preparations and Household Remedies. By Martin I. Wilbert. P. H. R., Feb. 12, 1915.
257. Impounded Waters—A Study of Such Waters on the Coosa River in Shelby, Chilton, Talladega, and Coosa Counties, Ala., to Determine the Extent to which They Affect the Production of Anophelines, and of the Particular Conditions which Increase or Decrease their Propagation. By J. A. A. LePrince. P. H. R., Feb. 12, 1915.
258. Malaria Control—Drainage as an Antimalarial Measure. By J. A. A. LePrince. P. H. R., Feb. 19, 1915.
259. Rat Proofing the Public Docks of New Orleans—A Report on Its Possibility and Cost. By H. P. Letton. P. H. R., Feb. 19, 1915.
260. Control of Malaria—Oiling as An Antimosquito Measure. By J. A. A. LePrince. P. H. R., Feb. 26, 1915.
261. Hypochlorite Treatment of Water Supplies—Portable Plant and Field Equipment for Its Administration. By H. A. Whittaker. P. H. R., Feb. 26, 1915.
262. Venereal Disease—Its Probable Prevalence—An Attempt to Reach a Definite Basis of Statistical Value. By Charles S. Banks. P. H. R., Feb. 26, 1915.

263. Trachoma—A Survey of Its Prevalence in the Mountain Section of Eastern Kentucky. By John McMullen. P. H. R., Mar. 5, 1915.
264. State Laws and Regulations Pertaining to Public Health—Adopted During the Year 1913. P. H. R., 1913 and 1914.
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UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION
IN FLORIDA

BY

CARROLL FOX

Surgeon

United States Public Health Service

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PUBLIC HEALTH ADMINISTRATION IN FLORIDA.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of public health organization and administration in the State of Florida carried on throughout a period of approximately three months, beginning November 29, 1915.

Florida has a gross area of 58,666 square miles. It forms a large peninsula, having the Atlantic Ocean on the east and the Gulf of Mexico on the west, and has therefore a long coast line with several important seaports having communication with other States and with foreign countries.

The mild, or even warm, winters of the State and its semitropical environment offer a great attraction, not only to permanent settlers, but to tourists and invalids seeking relief from the cold winters of the North.

The principal products of the State are naval stores, lumber, phosphate, citrus and other fruits, garden stuff, cotton, tobacco, and sponges.

Manufacturing is of less importance, except for the manufacture of cigars, which forms a large industry in Tampa and Key West.

Dairying and cattle raising are carried on to some extent.

The population of the State according to the State census of 1915 is 921,569;² the Negro race forms approximately 40 per cent of that number, and for this reason the problems in sanitation become more difficult to solve.

In the course of this study the following-named cities were visited: Jacksonville, Tampa, Pensacola, Miami, Key West, St. Augustine, and Tallahassee.

For information and assistance received in the preparation of this report the writer is indebted to the State health officer and his subordinates, and to other State and local officials.

STATE BOARD OF HEALTH.

The constitution of the State of Florida, adopted in 1885, provides for the establishment of a State board of health, and of county boards of health. It further specifies that, "The State board of health shall have supervision of all matters relating to public health,

¹ Reprint from the Public Health Reports, vol. 31, No. 22, June 2, 1916, pp. 1359-1407.

² In computing statistics the estimated population figures of the United States Census Bureau were used in the case of the four cities in the registration area; for the other cities and for the State as a whole, State census figures have been used.

with such duties, powers, and responsibilities as may be prescribed by law;" and that, "The county boards of health shall have such powers, and be under the supervision of the State board of health to such extent as the legislature may prescribe."

Under this authority there was established by the legislature in 1889, a State board of health, and laws were enacted giving it certain powers and duties. This step was taken at the time mainly because of the fear of yellow fever, a disease having produced such widespread havoc that, in the opinion of the people, its importance overshadowed all other diseases. The laws passed at the time, and in fact, several passed subsequently, were enacted without an understanding of the way in which the disease is transmitted, and are now antiquated, requiring unnecessary procedures and frequently referring to "noisome odors" and "noxious gases," which were supposed to play a part in the propagation of the disease. Two other diseases likewise feared by the people were mentioned in the early law, viz, cholera and smallpox.

Attempts have been made from time to time, with more or less success, to bring the laws up to date.

Appointment and tenure of office.—The State board of health is required to be composed of three "discreet" citizens of the State appointed by the governor and confirmed by the senate. Each member holds office for four years and until his successor is appointed and qualified.

Meetings.—The board meets on the second Tuesday of February each year. Either the governor of the State, or the president of the board, is given authority to call a meeting at any time and at such place as he may designate. At the first meeting of the board a president must be elected from among its members.

Salary and expenses.—The members of the State board of health receive a per diem of \$6 for each day of actual session, and mileage at the rate of 10 cents per mile.

Powers and duties of the board.—The powers and duties of the State board of health are: To exercise a general supervision over the public health of the State; to prevent the importation and spread of hydrophobia; to authorize the institution or operation of quarantine within the State and to modify or abrogate it; to impose upon railroads and navigation companies or individuals owning or operating steamships or other vessels, such restrictions and regulations providing for inspection, quarantine, and sanitary rules as may be necessary to protect the health of the people of the State.

In addition, the State board of health is empowered to make, adopt, promulgate, and enforce rules and regulations to preserve the public health of the State; for the sanitation and disinfection of vehicles of common carriers, convict camps, prisons, jails, factories,

hotels, schools, and other places used by or open to the public; for the treatment, segregation, and disinfection of animals having communicable diseases; to prevent the spread of rabies; to care for segregation and isolate persons having communicable disease; for the disposition of garbage or sewage, or other refuse in or near an incorporated or unincorporated community; for the investigation and study of cases of disease or epidemics, and the means of prevention; for the dissemination of public health information; and for the supervision and regulation of municipal and county sanitation.

For violation of any regulation made by the State board of health there is provided a fine of not to exceed \$1,000, or imprisonment for not to exceed one month.

The entire composition of the board of health may be changed with each change of governors, a system whereby men who have gained experience are liable to be supplanted by men lacking that qualification, and one that is not conducive to a successful fight against disease. There is likewise a possibility that politics may creep in, producing a very unfortunate situation and one to be shunned by all health departments. It would seem best to increase the number of members of the board of health to seven, one member only to be appointed each year, and the term of service to be five years.

It is to be understood that while the suggestion has been made in this, as well as in other reports, that the controlling board be continued with certain necessary changes, the writer does not consider it ideal, but one rather of expediency or policy. The ideal system is undoubtedly that contemplating a one-man control with an advisory board.

Notwithstanding that the State board of health is carrying on with great credit many of the activities required of such a board, the organization of the work is rather incomplete. There are four divisions, viz, executive division, laboratory division, division of vital statistics, and the veterinary division. The executive division presided over by the State health officer, includes a number of activities which should be segregated and placed under a separate head, or bureau chief.

The Executive Division.

The executive division is under the immediate control of the State health officer, who has as his assistants a medical officer known as an assistant to the State health officer, and a clerical force.

The personnel of this division and their respective salaries are at present as follows:

| | |
|--|---------|
| State health officer..... | \$3,000 |
| Assistant to the State health officer..... | 2,000 |
| Chief clerk..... | 1,500 |
| Auditor..... | 1,500 |
| 1 stenographer..... | 1,200 |

| | |
|-----------------------------------|---------------|
| 1 stenographer..... | \$720 |
| 1 stenographer ¹ | 600 |
| 1 filing and mailing clerk..... | 720 |
| 1 office boy..... | 240 |
| 1 janitor..... | 600 |
| 1 gardener..... | 390 |
| | <hr/> 12, 470 |

State health officer—Appointment and qualifications.—The State health officer is appointed by the State board of health. He must be a physician graduated from a recognized medical school, an expert in the diagnosis of yellow fever, smallpox, cholera, and other infectious diseases, and skilled in hygienic and sanitary science.

Term of office and salary.—He holds his office for a term of four years and until his successor is appointed and qualified. His salary is \$3,000 per annum, and he is entitled to actual and necessary expenses when traveling on official business.

Powers and duties.—The State health officer is empowered to act as executive officer and secretary of the State board of health. In this capacity he is responsible for the enforcement of all laws with the administration of which the State board of health has been charged by the legislature. He is required personally to investigate reported cases of yellow fever, smallpox, cholera, and hydrophobia. In the case of the latter, one of his agents may carry on the investigation and take the necessary steps to prevent the spread of the disease, and may call upon sheriffs and police officers in the city to assist in the enforcement of regulations. The State health officer is given a general control over all intrastate quarantine systems. He is authorized to abate nuisances. In addition, there are certain duties imposed upon him by the early law which are now antiquated and need not be mentioned.

The State health officer of Florida is a full-time health officer and has acted in that capacity since the establishment of the State board of health in 1889. He is, therefore, a man of long and extensive experience in public health work.

Assistant to the State health officer.—A law provides that there shall be employed an assistant State health officer to receive a per diem of \$15 a day and mileage, for each day that he is engaged in active service. The activities of the State board of health are now so extensive that the assistant as contemplated under this act would have to be employed every day, which would prove an expensive procedure. In lieu of this a medical officer from the field has been detailed as assistant to the State health officer. His duties are virtually those of an assistant executive officer, relieving the State health officer of certain duties in connection with the correspondence, super-

¹ Detailed for duty with the president of the board of health.

vision of the different activities of the State board of health and the performance of a certain amount of field work.

Attorney for the State board of health.—The attorney of the State board of health is a resident of Jacksonville and refuses compensation for his services.

Chief clerk.—The chief clerk is in charge of the clerical force employed by the State board of health and exercises a general supervision over property, records, and accounts. He is also stenographer for the State board of health during its meetings.

Auditor.—The auditor is responsible for the correctness of all bills and the preparation of vouchers together with their transmission to the comptroller, as well as acting as the bookkeeper of the State board of health.

Requisitions.—Requisitions for supplies are required except when the purchase amounts to less than \$1 or when it may be classed as an emergency expenditure. When articles are bought under these circumstances the official making the purchase is reimbursed at the end of the month upon presentation of an expense account.

Requisitions are made in triplicate. They are signed by the State health officer and the auditor of the State board of health. The triplicate is filed in the office of the individual making the requisition, the duplicate in the office of the auditor and the original sent as an order to the firm from which the supplies are to be obtained.

Requisitions from the branch laboratories are O. K'd by the chief of the main laboratory before they are submitted to the State health officer.

It is suggested that requisitions be submitted on the first of January and July of each year to cover a six months' supply of articles. Thus a larger quantity of material could be bought at one time and a better price obtained. The form or requisition should be changed so that each new requisition should show the amount on hand at the date of the last requisition, the amount received during the previous six months, the amount on hand at the date of the present requisition and the amount required for the coming six months, with additional space for unit price, total price, and catalogue number. These forms may be devised to be used both as a requisition and an order.

Vouchers.—Bills must be submitted in duplicate. After they have been checked by the individual receiving the supplies, duplicate vouchers are made out, certified to by the State health officer and approved by the president of the State board of health. The original voucher, together with the original bill, is transmitted to the State comptroller for settlement, while the duplicate voucher and the duplicate bill are filed in the office of the auditor. At the same time a postal card is addressed to the payee informing him that his bill has been forwarded to the State comptroller for payment.

The State board of health is allowed by law the sum of \$2,500 monthly from which to pay traveling expenses or other expenses requiring prompt settlement. This fund is disbursed by the auditor of the State board of health. At the end of the month the vouchers so paid, together with any balance from the fund, are transmitted to the State comptroller with the request that another sum of \$2,500 be allotted for the following month.

All accounts are entered under the name of the payee in a large book ruled so that the amounts may be segregated according to the division of the State board of health incurring the expenditure or the activities necessitating the expense. Special forms are used by the employees of the State board of health on which to itemize their travel or emergency expenses.

It would seem better to arrange the bookkeeping so that the different expenditures could be itemized according to the nature of the expense as well as according to the bureau or division incurring the expense. This could be done readily by instituting a filing-card system for expenditures. There should be a card for each item or group of items, ruled to show the date, the voucher number for reference, and the bureau or division incurring the expense. Also a cross-reference card on which could be shown the amount of expense incurred in certain well-defined activities, as, for instance, expenses incurred in antituberculosis work or on account of smallpox, etc.

The book at present in use would be needed for the entry of expenditures under name of payee and voucher number only.

Buildings.—The headquarters of the State board of health are located in Jacksonville in a fireproof building owned by the board. This building is steam heated, well lighted and ventilated, and provided with modern toilet appliances. Its construction was finished in 1912 at a cost, including grounds, of approximately \$40,673.82. The grounds were obtained from the city of Jacksonville at the nominal cost of \$100. Being marshy land a great deal of filling was required.

On the first floor of this building ample laboratory space is provided, together with an office for the chief of the diagnostic laboratory and a room to house the division of vital statistics. The second floor contains six rooms occupied respectively by the State health officer, the assistant to the State health officer, the chief clerk, the auditor, a stenographer, and the library. The veterinary division is located in the basement, which also contains rooms for washing glassware and preparing media used in the laboratory, storage space, the heating apparatus, and the ice machine. The attic is utilized as a store room for old records. In connection with the auditor's office there is provided a fireproof vault. Located on the ground surrounding the building is an animal house designed to care for the animals used in the laboratory.

The main building is fast becoming too small to accommodate the various offices of the State board of health and in time will have to be enlarged.

The State board of health also owns a brick office building at Tampa, which was constructed in 1910 at a cost of \$17,511.60. This building houses the district health officer and the branch laboratory and contains much more space than is at present necessary. Some of the extra space is at present being used by the county medical society and as a laboratory for the city food and drug department.

There is another fireproof building owned by the State board of health at Pensacola, which was completed in 1915 at a cost of \$19,424.34. It furnishes space for the branch laboratory and an office for the district health officer. The building is large, well planned, and well constructed. The necessity for such a large building is not apparent. One room in the building has been loaned to the county medical society. The State board of health also owns four isolation hospitals. Mention of these will be made hereafter.

Office hours.—The office hours of the employees of the board of health are from 8.30 a. m. to 5 p. m., with one hour for lunch, every day except Sundays and holidays. Some of the bacteriologists are not infrequently engaged in their duties before this hour and are present in the laboratory Sundays and holidays for a sufficient length of time to attend to necessary work. Each employce is allowed one month's leave of absence on full pay, during the year.

Library.—The library located at the headquarters of the State board of health is small but well ordered and contains text books, books of reference, scientific magazines and reports, and publications from other health organizations. The library is well catalogued and indexed according to subject and author, making it possible to find with little delay any article desired.

THE REGISTRATION OF BIRTHS AND DEATHS.

The State legislature in 1915 enacted a law providing for a State-wide registration of births and deaths. This act was modeled after the law proposed by the Bureau of the Census, and it is therefore unnecessary to summarize it here. It has not as yet been put into effect by the State board of health, however, so that at present the registration of births and deaths is accomplished by means of the old system. The successful operation of this system depends primarily upon the enactment by municipalities of a local ordinance in conformity with a model presented by the State board of health. One hundred and twenty cities now have such an ordinance, though few seem to be making any great effort to enforce it. There are, however, certain municipalities where death returns are satisfactory. In fact, four cities have been admitted to the death registration area, and there are other municipalities where, judging from the death

rates, the registrations seem equally good. The personnel of the division of vital statistics and their respective salaries are as follows:

| | |
|-------------------------------|-------------|
| 1 statistician..... | \$2,000 |
| 1 clerk and stenographer..... | 900 |
| | <hr/> 2,900 |

Death registration.—The notification of deaths in the State as a whole is very deficient. There were received in 1915 from all sources 5,446 death certificates, which number in a population of 921,569 gives a death rate of 5.9 per 1,000—obviously incorrect. In order to arrive at a figure which would represent approximately the death rate for the State as a whole, computations have been made based on the records from 21 cities having a death rate of over 10. The results show that the four cities in the registration area have a crude death rate in the aggregate of 16.2 per 1,000. The 17 cities not in the registration area have a combined death rate of 16.6 per 1,000, while the 21 cities have a combined death rate of 16.4. It is thought that the latter figure probably approximates the death rate obtaining over the entire State. No corrections have been made for non-residence, and stillbirths have been excluded. On the basis of a death rate of 16.4 per 1,000 population it may be assumed that at present but one-third of the deaths that actually occur in the State, are notified to the State registrar.

Preventable diseases.—In determining the number of deaths from preventable diseases, only the deaths recorded in the 21 cities mentioned above have been analyzed. These records show that there were during 1915, 2,318 deaths from causes that might have been prevented, which is 53.4 per cent of the total deaths registered in this area. The following table shows these deaths by causes, death rates per 100,000, etc.

Deaths from preventable diseases, all ages, in 21 cities of Florida having a death rate of over 10 per 1,000, year ended Dec. 31, 1915.

| Disease. | Total number of deaths. | Death rate per 100,000 population. |
|--|-------------------------|------------------------------------|
| Tuberculosis, pulmonary..... | 468 | 177.1 |
| Tuberculosis, other forms..... | 47 | 17.7 |
| Pneumonia..... | 253 | 95.7 |
| Typhoid fever..... | 81 | 30.6 |
| Malaria..... | 41 | 15.5 |
| Influenza..... | 49 | 18.5 |
| Measles..... | 10 | 3.7 |
| Diphtheria..... | 41 | 15.5 |
| Whooping cough..... | 10 | 3.7 |
| Tetanus..... | 39 | 14.7 |
| Syphilis..... | 52 | 19.6 |
| Meningitis, exclusive of tuberculosis..... | 27 | 10.2 |
| Septicemia, including puerperal..... | 54 | 20.4 |
| Diarrhea and enteritis..... | 285 | 107.8 |
| Dysentery, endamoebic and bacillary..... | 13 | 4.9 |
| Other acute infections..... | 45 | 17.0 |
| Malignant growths..... | 171 | 64.7 |
| Pellagra..... | 127 | 48.0 |
| Accidental deaths..... | 194 | 73.4 |
| Causes peculiar to early infancy..... | 311 | 117.7 |
| Total..... | 2,318 | ..... |

Table of information relating to birth and death registration in 21 cities of Florida having a recorded crude death rate of over 10 per 1,000, year ended Dec. 31, 1915.

| | Population. | | | Number of deaths. | | | Death rate per 1,000. | | | Number of births. | | | Birth rate per 1,000. | | | Still- births. |
|---|-------------|----------|---------|-------------------|----------|--------|-----------------------|----------|--------|-------------------|----------|--------|-----------------------|----------|--------|-------------------|
| | White. | Colored. | Total. | White. | Colored. | Total. | White. | Colored. | Total. | White. | Colored. | Total. | White. | Colored. | Total. | |
| Cities in registration area for deaths: | | | | | | | | | | | | | | | | |
| Jacksonville..... | 35,909 | 37,228 | 73,137 | 530 | 824 | 1,354 | 14.7 | 22.1 | 18.5 | 947 | 724 | 1,671 | 26.3 | 19.4 | 22.8 | 185 |
| Pensacola..... | 14,290 | 11,452 | 25,742 | 176 | 241 | 417 | 12.3 | 21.0 | 16.2 | 357 | 188 | 545 | 24.9 | 16.4 | 21.1 | 59 |
| Tampa..... | 39,259 | 12,262 | 51,521 | 491 | 253 | 744 | 12.5 | 20.6 | 14.4 | 1,164 | 220 | 1,384 | 29.6 | 17.9 | 26.8 | 85 |
| Key West..... | 15,487 | 5,950 | 21,437 | 193 | 92 | 285 | 12.4 | 15.4 | 13.2 | 343 | 106 | 449 | 13.2 | 17.8 | 20.9 | 31 |
| Total..... | 104,945 | 66,892 | 171,837 | 1,390 | 1,410 | 2,800 | 13.2 | 21.0 | 16.2 | 2,811 | 1,238 | 4,049 | 26.7 | 18.5 | 23.5 | 360 |
| Cities not in registration area: | | | | | | | | | | | | | | | | |
| Oriando..... | 1,482 | 1,260 | 2,742 | 97 | 51 | 148 | 10.1 | 34.9 | 23.1 | 77 | 23 | 100 | 31.7 | 27.7 | 15.5 | 16 |
| Apalachicola..... | ..... | ..... | 6,449 | 15 | 44 | 59 | ..... | ..... | 21.5 | 47 | 35 | 82 | ..... | ..... | 29.9 | 3 |
| St. Petersburg..... | ..... | ..... | 7,188 | 114 | 36 | 150 | ..... | ..... | 20.8 | 92 | 44 | 136 | ..... | ..... | 18.9 | 17 |
| Ocala..... | ..... | ..... | 5,370 | 34 | 75 | 109 | ..... | ..... | 20.2 | 52 | 29 | 81 | ..... | ..... | 15.0 | 6 |
| St. Augustine..... | ..... | ..... | 5,471 | 61 | 46 | 107 | ..... | ..... | 19.5 | 74 | 32 | 106 | ..... | ..... | 19.3 | 3 |
| Palatka..... | ..... | ..... | 4,622 | 37 | 44 | 81 | ..... | ..... | 17.5 | 51 | 40 | 91 | ..... | ..... | 19.6 | 8 |
| Tarpon Springs..... | ..... | ..... | 1,938 | 17 | 16 | 33 | 12.0 | 19.9 | 17.0 | 42 | 9 | 51 | ..... | ..... | 26.3 | 7 |
| Fernandina..... | 1,158 | 1,953 | 3,111 | 13 | 39 | 52 | ..... | ..... | 16.7 | 8 | 42 | 50 | 6.9 | 21.5 | 16.0 | 3 |
| Fort Myers..... | 2,222 | 1,022 | 3,244 | 34 | 20 | 54 | 15.3 | 19.5 | 16.6 | 56 | 12 | 68 | 25.2 | 11.7 | 20.9 | 3 |
| Miami..... | 9,916 | 5,676 | 15,592 | 114 | 129 | 243 | 11.4 | 22.7 | 15.5 | 210 | 135 | 345 | 21.1 | 23.7 | 22.1 | 37 |
| Gainesville..... | 3,609 | 3,127 | 6,736 | 42 | 62 | 104 | 11.6 | 19.8 | 15.4 | 86 | 42 | 128 | 23.8 | 13.4 | 19.0 | 11 |
| Plant City..... | ..... | ..... | 3,229 | 25 | 23 | 48 | ..... | ..... | 14.8 | 54 | 11 | 65 | ..... | ..... | 20.1 | 9 |
| Lakeland..... | ..... | ..... | 7,287 | 79 | 27 | 106 | ..... | ..... | 14.5 | 78 | 18 | 96 | ..... | ..... | 13.1 | 5 |
| West Tampa..... | 6,867 | 970 | 7,837 | 86 | 20 | 106 | 12.5 | 20.6 | 13.5 | 301 | 29 | 330 | 43.8 | 29.8 | 42.1 | 20 |
| Tallahassee..... | ..... | ..... | 5,192 | 30 | 35 | 65 | ..... | ..... | 12.5 | 52 | 31 | 83 | ..... | ..... | 15.9 | 18 |
| De Land..... | 2,054 | 1,436 | 3,490 | 24 | 18 | 42 | 11.6 | 12.5 | 12.0 | 45 | 12 | 57 | 21.9 | 8.3 | 16.3 | 4 |
| De Funiak Springs..... | ..... | ..... | 2,824 | 20 | 11 | 31 | ..... | ..... | 10.9 | 22 | 11 | 33 | ..... | ..... | 11.6 | 2 |
| Total..... | ..... | ..... | 92,322 | 842 | 696 | 1,538 | ..... | ..... | 16.6 | 1,347 | 555 | 1,902 | ..... | ..... | 14.0 | 172 |
| Grand total, 21 cities..... | ..... | ..... | 264,159 | 2,232 | 2,106 | 4,338 | ..... | ..... | 16.4 | 4,158 | 1,793 | 5,951 | ..... | ..... | 22.5 | 532 |

Deaths in infants under 1 year, in 21 cities of Florida having a crude death rate of over 10 per 1,000 inhabitants, year ended Dec. 31, 1915.

| Causes given in death certificates. | Deaths. | Per cent of total deaths under 1 year. |
|--|---------|--|
| Tuberculosis..... | 2 | 0.35 |
| Pneumonia..... | 63 | 11.0 |
| Tetanus..... | 19 | 3.3 |
| Malaria..... | 2 | |
| Influenza..... | 2 | |
| Measles..... | 1 | |
| Diphtheria..... | 2 | |
| Whooping cough..... | 4 | |
| Syphilis..... | 7 | 5.0 |
| Typhoid fever..... | 1 | |
| Erysipelas..... | 1 | |
| Infantile paralysis..... | 1 | |
| Bronchitis..... | 6 | |
| Pyemic infection..... | 2 | |
| Meningitis, exclusive of tuberculosis..... | 14 | 2.4 |
| Diarrhea and enteritis..... | 121 | 21.2 |
| Pellagra..... | 1 | .17 |
| Accidental deaths..... | 9 | 1.5 |
| Premature births..... | 100 | 17.5 |
| Congenital debility, convulsions, etc..... | 74 | 13.0 |
| Other causes, mostly preventable..... | 61 | 10.7 |
| Unspecified..... | 76 | 13.3 |
| Total..... | 569 | 99.42 |

Birth registration.—There were registered during the year 1915 from the 21 cities 5,951 births as against 8,178 for the entire State. The recorded birth rate for the 21 cities in the aggregate is therefore 22.5 per thousand while the recorded birth rate for the State is but 8.8 per 1,000. The city showing the highest birth rate is West Tampa with a recorded rate of 42.1 per 1,000, or 43.8 for the white and 29.8 for the colored population. Several other cities show a commendable effort to secure the notification of births as indicated by a recorded rate of 25 and over per 1,000.

Discussion.—It is desirable to bring the State of Florida into the registration area for deaths as soon as possible. To do this will require the institution of many measures which, as yet, have not been attempted. Progress was unfortunately interrupted by the untimely death of the statistician of the State board of health. However, there has since been appointed a statistician familiar with registration methods. It is therefore thought that specific suggestions for putting the new law into effect are unnecessary.

After the law has been put into effect and the number of certificates registered increases, it will be necessary to enlarge the clerical force in order to attend to the increased amount of correspondence that will necessarily occur.

EPIDEMIOLOGICAL ACTIVITIES.

The epidemiological activities of the State board of health will be discussed under the following headings: The notification of disease, the control of disease, the diagnostic laboratories, and the field forces, active and potential.

The Notification of Disease.

Requirements of laws.—A law enacted in 1889 required the notification of yellow fever, cholera, and smallpox only. At that time yellow fever especially had caused such widespread havoc throughout the State that it was uppermost in the minds of the people.

The "vital statistics" act passed in 1915 carried with it a clause relating to the notification of disease.

These laws are summarized as follows:

It is the duty of every physician in the State to report immediately to the president of the board of health, by telegraph or other expeditious manner, any case of yellow fever, smallpox, or cholera coming within his practice. For failure to report, there is provided a fine of not to exceed \$1,000 or imprisonment not to exceed six months.

Physicians are also required to report the above-named diseases to the city or county health officer, or, if there is no such officer, to the mayor or the chairman of the county commissioners. For failure to report there is provided a fine of \$100 or imprisonment for 30 days.

The State board of health is empowered "to adopt, promulgate, and enforce rules and regulations requiring the notification of all cases of sickness necessary for the preservation and protection of the public health."

Requirements of regulations.—In addition to the law which requires the notification of smallpox, yellow fever, and cholera, the State board of health, acting under the general authority granted by law to promulgate regulations in the interest of the public health, has formulated regulations as follows:

It is the duty of every physician to report immediately to the State health officer or his representative, by first mail, any case of tuberculosis, typhoid fever, scarlet fever, diphtheria, measles, cerebrospinal meningitis, anterior poliomyelitis, bubonic plague, glanders, anthrax, rabies, or leprosy occurring in his practice.

Where no physician is in attendance it then becomes the duty of the person having charge of, or in attendance upon, or upon whose premises a case occurs, to make the necessary report.

Methods of procedure.—The form devised for the use of physicians to report diseases is a postal card containing the usual questions. Physicians, however, have not voluntarily made use of the cards, and the regulation is not enforced. As a result the records from this source are worthless. In a few instances letters may be found on file from physicians reporting cases of, or rather outbreaks of, certain diseases, but such reports are not worth analysis.

Positive reports from the laboratories have been practically the only source of information of the prevalence of malaria, typhoid fever, tuberculosis, and diphtheria occurring in different localities. While it is true that many physicians of the State make use of the laboratory facilities, the information of the prevalence of disease obtained in this way is incomplete and inadequate.

Discussion.—It is essential that the clause in the "vital statistics" act recently passed by the legislature and giving authority to

the State board of health to collect morbidity reports be put into effect without delay.

Even then it will be some time before all of the physicians learn to appreciate their obligations to the State and to respond to the request that diseases be reported.

It would also be wise to continue the acceptance of positive reports from the laboratories in lieu of morbidity reports, in which case data cards submitted with specimens and on which are noted results of the examination, should conform in size to the morbidity report cards.

The Control of Disease.

Requirements of laws.—In addition to the general powers and duties vested in the State board of health, the following provisions of law apply directly to the control of disease:

It is the duty of the local authorities after a suspicious case of yellow fever, cholera, or smallpox is reported, to take immediate steps to make the necessary examination, furnish medical attention, food, and clothing, and to do whatever may be necessary to care for, segregate, and guard the case until the arrival of the State health officer.

Whenever the State health officer has investigated a suspicious case as above and determined that the same is a menace to the citizens of the State, he or his agent is required to assume charge, after which all legitimate expenses concerned therewith must be defrayed out of the funds of the State board of health.

For a violation of these provisions by any physician, city health officer, mayor, county physician, or chairman of the board of county commissioners there is provided a fine of \$100 or imprisonment for 30 days.

It is unlawful for any person to operate a hotel, boarding house, restaurant, or lunch counter unless all doors, windows, and similar openings in the dining room, kitchen, and passageways between and hallways leading thereto, or any place where food is prepared, are screened with wire netting with a mesh sufficiently close to prevent the admission of flies.

The law further provides that all food offered for sale, and which may be eaten raw, or without further cooking, must be screened with wire netting of sufficiently close mesh to prevent the admission of flies.

It is made the duty of the person operating any place where food is sold to keep such place free of flies so far as possible.

For violation there is provided a fine of not to exceed \$50 or imprisonment not to exceed three months. Each day that business is conducted in violation of the act constitutes a separate offense.

Requirements of regulations.—Acting under the general provisions of statute the State board of health has promulgated the following provisions in regulations for the control of disease:

Concealing a case of communicable disease or any personal effects or other articles which have been used by such case is prohibited.

When it is deemed necessary, the State health officer or his assistant is authorized to remove to a suitable place for isolation, any case of communicable disease and provide the required medical treatment.

Where the patient is too sick to be moved, isolation may be practiced on the premises.

Contacts may be quarantined provided that in the case of scarlet fever and diphtheria, when reasonable precautions are taken, the breadwinner may be permitted to carry on his vocation.

By isolation is meant the complete separation of the sick person and those dependent upon him, from all other persons on the premises.

It is advised that a nurse be obtained but where this is impossible for financial reasons, the parent or other attendant assuming the duties of nurse must be isolated with the patient.

Warning placards are required in the case of diphtheria, scarlet fever, measles, epidemic cerebrospinal meningitis and smallpox. In the last case, however, only those contacts who refuse vaccination are quarantined.

The warning cards are furnished by the State board of health, and it is prohibited to alter, deface, remove or destroy them without the authority of the State board of health or the local health officer.

The occupant of a placarded house is required to notify the State board of health when such card has been removed or destroyed without authority.

It is prohibited to use any apartment previously occupied by a person ill with smallpox, typhoid fever, diphtheria, epidemic cerebrospinal meningitis, or tuberculosis, until such apartment has been thoroughly disinfected. When these requirements are not complied with the local or State health officer may placard the house with a warning to this effect.

It is forbidden to spit upon sidewalks, railroad depots, cars, or platforms, on the floors or walls of any church, theater, street car, or in other public place except in spittoons provided for the purpose. Spittoons must be furnished for this purpose by the person in control. Spittoons must be cleaned once a day and each must contain at least one-half pint of a germicidal solution.

A placard prohibiting spitting, to be furnished by the State health officer, must be displayed in all stations, cars or other vehicles.

Notwithstanding the meagerness of the regulations the methods of prevention as practiced are in conformity with modern procedures. The methods advocated are shown in the tabulation. It should be noted that they are not always covered by either law or regulation.

Smallpox.—Smallpox, a disease entirely too prevalent in the State, is due to a failure on the part of some of its citizens to protect themselves by vaccination. It might be said in this connection that in the city of Tampa where last year there were some 56 cases of smallpox, but few originated in the foreign population who are adequately vaccinated. The vast majority were in unvaccinated native-born Americans.

The laws of the State require that the expense of caring for smallpox be defrayed from the funds of the State board of health, and so long as there are unprotected individuals there is a constant expenditure necessary to provide for those who contract the disease. Those citizens who respect the rights of their neighbors and submit to vaccination are compelled to stand their share of the expenses incurred solely because of the perverseness of those who will not submit to vaccination and who, therefore, lay themselves open to infection.

For some years the State has had to maintain four hospitals solely for the purpose of isolating smallpox. During the year 1915 these hospitals cared for some 99 cases of smallpox at a cost to the State

of \$4,277.64. The personnel of these hospitals and their respective salaries are as follows:

| | |
|--------------------------------------|-------|
| 1 superintendent (Duval County)..... | \$780 |
| 1 attendant (Duval County)..... | 360 |
| 1 caretaker (Hillsboro County)..... | 480 |
| 1 caretaker (Escambia County)..... | 360 |
| 1 caretaker (Dade County)..... | 180 |
| Total..... | 2,160 |

Many of the cases are of residents of the city in which they are found and are occasioned by neglect on the part of local authorities to enforce vaccination, which likewise accounts for the frequency of secondary cases. The local authorities are too prone in public health matters to shift their responsibilities to the State, forgetting that they are under some obligation to share morally and financially in the fight against disease. There is no more reason why the State should be required to defray the expenses incurred in caring for smallpox patients than for patients suffering from diphtheria or any other common communicable disease, except that, unfortunately, an old law in the case of smallpox, cholera, and yellow fever requires the State to shoulder the entire burden. The writer knows of no other instance where the State is required to maintain isolation hospitals for local communities. This is a duty of the county, the city, or both. Arrangement should be made with the counties whereby these hospitals could be transferred. They need be opened only as the occasion arises. There is also a need for a State-wide vaccination law, thereby permitting the health officer to apply the only sure method for eradicating smallpox.

Tuberculosis.—Because of its equable climate, Florida is thought to be peculiarly suited to those suffering from tuberculosis, for which reason a great many tuberculous individuals from farther north migrate into the State. The death rate from this disease is therefore high, being for the 21 cities from which death certificates were analyzed, 177.1 per 100,000. Because of a deficiency in the records it was not possible to determine the death rate among residents only. It is obvious, however, that the problem is even greater here than in many other localities.

The State legislature has authorized the State board of health to erect a tuberculosis sanatorium and make the necessary regulations for its management. Fortunately this act did not provide any money, so that what would have been a useless expenditure was obviated. Any hospital which the State might build would be entirely inadequate to meet the situation. The question is one that must be carefully considered by each community, for it is only by a multiplicity of hospitals, and therefore a distribution of expenses, that isolation is feasible. The necessity, however, is great and should be immediately provided for by individual counties.

Tuberculosis is said to be especially common among the cigar makers. There is no law or regulation prohibiting a person suffering from tuberculosis to work in cigar factories. The prevalence of the disease is no doubt due to the close proximity of the workers to each other and the overcrowded conditions in the home. It would seem consistent for the State board of health to promulgate regulations for the maintenance of sanitary conditions in the cigar factories of the State.

Typhoid fever.—The death rate from typhoid fever per 100,000 population for the 21 cities during the year 1915 was 30.6, a rate too high for a progressive and growing State encouraging immigration. It is a good index to show the need of epidemiological studies and activities along the lines of sewage disposal and water purification by a competent public health engineer in the State board of health, as well as a more careful supervision of patients, and a more thorough enforcement of the law requiring the screening of privies.

Pellagra.—The death rate for pellagra per 100,000 in the cities under consideration in 1915 was 48.

The State board of health has made through its district health officers, public health nurses, and physicians of the State a more or less superficial survey of the pellagra situation and has carried on some active work along the lines laid down by Goldberger, with some excellent results. Without morbidity reports, it is difficult to get any idea of the prevalence of this or in fact any other disease.

Tetanus.—The death rate from tetanus in the 21 cities in 1915 was 114.7 per 100,000. Of the 39 cases reported, 19 were in infants under 11 year of age. As in the case of puerperal septicemia and ophthalmia neonatorum, the ignorant midwife is largely responsible for the condition, which occurs mainly among the colored population. The State board of health should attempt some supervision over the work of these women through its field nurses, and should issue free of charge prophylactic packages against tetanus and ophthalmia neonatorum. The package used by the public health department of Cuba might be taken as a type. The State board of health issues tetanus antitoxin free to indigent cases.

Diphtheria.—The death rate per 100,000 for diphtheria in 1915 for the 21 cities was 15.5. There were 41 deaths from this disease. Comparing this number with the positive reports from the laboratories (the only morbidity reports available) there seems to have been a case-fatality rate of 5.3. It is probable that while practically all deaths have been reported from this area there are a number of cases which recover and from which specimens were not taken; the case-fatality rate, therefore, would be even lower than 5.3. This is a very good showing. It indicates a prompt and frequent use of antitoxin. The State board of health furnishes antitoxin to the indigent cases

free of charge, and has an arrangement with an establishment producing biologic products whereby those able to pay may secure the antitoxin at reduced rates. That the antitoxin may be easily secured, certain drug stores in different parts of the State have been designated as distributing centers.

Dysentery.—There were reported from the 21 cities during 1915, 13 deaths from dysentery, bacillary and endamœbic. In studying the death certificates filed with the State board of health one not infrequently encounters the term "dysentery," without any qualification, given as a cause of death. In the table of preventable diseases such diagnoses have been placed under the heading "diarrhea and enteritis." It is known, however, that both bacillary and endamœbic dysentery occur in the State and it would be well for the State board of health to carry on some investigations to determine the prevalence, especially of the latter.

Malaria.—There were reported from the 21 cities in 1915, 41 deaths from malaria, and there were found as the result of laboratory examinations 291 positive cases. Health departments of the Northern States are little concerned with this disease, but in Florida it causes no small amount of work to the bacteriologist. It is suggested that more intensive studies of malaria be carried on by the epidemiologist, bacteriologists, and sanitary engineer of the State board of health, so that accurate data may be obtained and placed before the local authorities with a view to securing their cooperation and ultimately eradicating the breeding places of anopheline mosquitoes in and near the centers of population.

Hookworm.—Hookworm has been found to be prevalent in Florida. In the past a large amount of dispensary work was done for the purpose of curing the disease. It was so difficult, however, to secure the cooperation of the people in the construction of sanitary privies, and reinfections were found to be so common that activities along this line have been discontinued except to families who agree to maintain better sanitary conditions. When the time arrives that a more extended campaign can be carried on against the insanitary privy it may be wise to reopen the dispensaries and resume the treatment of patients.

Trachoma.—Trachoma has been found to exist in several localities. The extent of its distribution is unknown and further investigations are necessary. While the health officer is not usually concerned with the treatment of disease outside of isolation hospitals, exceptions may be made both in the case of hookworm and trachoma, and it may be found wise at some future date to provide, as a part of the eradication measures, means for treating patients suffering from trachoma.

Occupational diseases.—With the exception of a few deaths from caisson disease among the sponge divers and accidents occurring

Tabulation of the methods pursued to prevent the spread of certain of the communicable diseases.

| Disease. | To be reported. | Placarded. | Isolation of patient. | Quarantine of contacts. | Terminal disinfection of rooms and articles. | Sale of dairy products. | Exclusion from schools. | | Special precautions. | Disinfection of discharges. |
|--|----------------------------|------------|--|---------------------------|--|-------------------------|-------------------------|--------------------|---|------------------------------------|
| | | | | | | | Patient. | Contacts. | | |
| Smallpox..... | Yes, immediately, by wire. | Yes..... | Yes, until complete desquamation. | Not if vaccinated.. | Yes..... | ..... | Yes..... | Not if vaccinated. | Vaccination of contacts (voluntary). Cultures from throat and nose of contacts and immunizing dose of antitoxin (voluntary). | Yes, from throat, nose, and mouth. |
| Diphtheria..... | Yes, immediately, by mail. | Yes..... | Yes, until two negative cultures obtained. | Yes, except breadwinners. | Yes..... | Prohibited. | Yes..... | Yes..... | ..... | Do. |
| Scarlet fever..... | do..... | Yes..... | Yes, until complete desquamation. | do..... | Yes..... | do..... | Yes..... | Yes..... | ..... | Do. |
| Measles..... | do..... | Yes..... | do..... | No..... | No..... | ..... | Yes..... | Not if immune. | ..... | Do. |
| Anterior poliomyelitis..... | do..... | No..... | Yes..... | No..... | No..... | ..... | Yes..... | No..... | ..... | Do. |
| Epidemic cerebrospinal meningitis..... | do..... | Yes..... | Yes..... | Yes..... | Yes..... | ..... | Yes..... | No..... | Instructions by visiting nurse when practicable. | Do. |
| Tuberculosis..... | do..... | ..... | ..... | ..... | Yes..... | ..... | ..... | ..... | ..... | ..... |
| Typhoid fever..... | do..... | ..... | ..... | ..... | ..... | Prohibited. | Yes..... | No..... | ..... | Yes, of feces and urine. |
| Leprosy..... | do..... | ..... | Yes..... | ..... | Yes..... | ..... | Yes..... | No..... | ..... | ..... |
| Trachoma..... | No..... | ..... | ..... | ..... | No..... | ..... | Yes..... | No..... | ..... | ..... |

among railroad employees, deaths from occupational diseases were few in number in 1915, and have been recorded as accidental deaths in the tabulation.

The Diagnostic Laboratory.

The main laboratory of the State board of health was established in 1903 and is located in the State board of health building at Jacksonville. On account of the steady increase in the amount of work and in order to facilitate the handling of specimens received from physicians and health officers located in more distant parts of the State, branch laboratories have been established from time to time, so that there are at present, in addition to the main laboratory, five others—one located at Tampa, one at Pensacola, one at Miami, one at Tallahassee, and one at Key West.

The work done at these laboratories consists of the examination of specimens for evidence of diphtheria, typhoid fever, malaria, tuberculosis, intestinal parasites, gonorrhea, ophthalmia neonatorum, rabies, and malignancy. In addition, a certain amount of water analysis is performed and occasionally the analysis of a milk sample submitted by an official of the State board of health while engaged in making a sanitary survey. At the last annual meeting of the State board of health (Feb. 8, 1916) it was decided to perform Wassermann reactions as a routine measure.

The members of the laboratory staff are permitted to perform certain laboratory work for physicians which is not always of a public-health nature. Such work includes blood counts, differential and plain, urinalysis, and the preparation of autogenous vaccines.

The personnel of the laboratories and their salaries at present are as follows:

| Central Laboratory (Jacksonville): | | Salary. |
|------------------------------------|--|----------------|
| Senior bacteriologist..... | | \$2, 500 |
| 1 assistant bacteriologist..... | | 1, 500 |
| 1 assistant bacteriologist..... | | 1, 200 |
| 1 assistant bacteriologist..... | | 900 |
| 1 stenographer..... | | 900 |
| 1 technician..... | | 480 |
| 1 orderly..... | | 360 |
| 1 orderly..... | | 300 |
| | | <hr/> \$8, 140 |
| Tampa Laboratory: | | |
| 1 bacteriologist..... | | 2, 000 |
| 1 assistant bacteriologist..... | | 1, 500 |
| 1 stenographer..... | | 780 |
| 1 janitor..... | | 480 |
| | | <hr/> 4, 760 |
| Pensacola Laboratory: | | |
| 1 bacteriologist..... | | 2, 000 |
| 1 janitor..... | | 480 |
| 1 office boy..... | | 240 |
| | | <hr/> 2, 720 |

| | |
|--|----------------|
| Miami Laboratory: | Salary. |
| 1 bacteriologist | \$2, 000 |
| 1 office boy | 240 |
| | <hr/> \$2, 240 |
| Tallahassee Laboratory: | |
| 1 bacteriologist (vacant) | 2, 000 |
| 1 office girl and stenographer | 240 |
| | <hr/> 2, 240 |
| Key West Laboratory: | |
| Laboratory in charge of assistant to the State health officer. No extra remuneration for laboratory work | |
| | <hr/> 20, 100 |

Methods of procedure.—In the case of diphtheria the mailing outfit in use consists of a sterile swab inclosed in a sterile test tube stopped with a cotton plug and packed in an approved mailing tube. Culture media are sent out only in case of a local epidemic where the health officer can be made responsible for their distribution. In order that a diagnosis may be made as promptly as possible, smears prepared from the swabs are first examined. At the same time a culture is made from the swab for subsequent examination. The type of the organism is always determined, but not reported nor recorded. The types commonly found and reported upon as positive are the A, C, and D, and A', C', and D'. The diphtheria work is performed for diagnosis, for the detection of carriers among contacts, and for the release of quarantine.

In the case of tuberculosis the mailing outfit consists of a wide-mouthed bottle containing about 10 c. c. of lysol solution and packed in an approved mailing tube. Upon receipt of a specimen of sputum for examination the bottle is placed in the autoclave and heated, after which its contents are found to be emulsified. It is then centrifugalized and examined by the usual method.

In the case of typhoid fever, malaria, and gonorrheal or other pus infection, the mailing outfit consists of two glass slides properly packed, on which drops of blood may be placed, if for the diagnosis of typhoid fever, or a smear of blood or pus, as the case may be, if for the diagnosis of malaria, or gonorrhea or other purulent infection.

Each mailing outfit is accompanied by a blank form to be filled in by the physician with the necessary data. The back of this blank contains directions for collecting the specimen. Upon receipt of a specimen for examination the specimen is given a serial number which, with certain of the information contained on the data sheet, is transcribed to a daily report sheet on which is afterwards added the result of the examination. This report is submitted daily to the secretary of the State board of health.

The result of the examination is reported by telephone, telegraph, or mail, depending upon the instructions received from the person submitting the sample. When a report is made by telephone or tel-

ograph it is always followed by a mailed report on a regular form devised for the purpose. Different forms are used for each disease, the form with its corresponding data blank for each disease having a distinctive color so that it may be quickly identified. Each week there is submitted to the secretary a weekly report containing the number of examinations that have been found positive for the commoner diseases and the locations from which the specimens were sent. Likewise there is made a monthly report containing this information, as well as similar information for the less prevalent maladies.

Upon the completion of an examination the results are entered on the original data sheet, which is filed numerically and indexed by name of physician and locality.

The diagnostic laboratories are well equipped to perform all work that they may be called upon to do, and the work performed therein is skillfully done.

Discussion.—The cost of maintaining the diagnostic laboratories in 1915 amounted to \$29,912.65. There were 40,677 examinations made, making a cost per examination of 73½ cents. Excluding the cost per examination in Key West, where no charge has been made for services, the lowest cost is found to be 60½ cents in the main laboratory at Jacksonville, where 19,708 examinations were made, at a total cost of \$11,959.85.

The following table gives these figures by laboratories:

| Laboratory. | Total examinations. | Average number bacteriologists employed during year. | Total number of months employed. | Total number of hours engaged in bacteriological work. | Examinations per hour per man. | Total cost of laboratory. | Cost per specimen examined. |
|------------------------|---------------------|--|----------------------------------|--|--------------------------------|---------------------------|-----------------------------|
| Main (Jacksonville)... | 19,708 | 4 | 47½ | 10,310 | 1.90 | \$11,959.08 | \$0.60½ |
| Tampa..... | 10,100 | 2½ | 30 | 6,558 | 1.54 | 6,901.98 | .68½ |
| Pensacola..... | 4,363 | 1 | 12 | 2,660 | 1.64 | ¹ 4,079.99 | .93½ |
| Miami..... | 2,395 | 1 | 12 | 2,660 | .90 | 2,950.47 | 1.23 |
| Tallahassee..... | 3,281 | 1 | 12 | 2,660 | 1.23 | 3,594.09 | 1.09½ |
| Key West..... | 830 | | | | | ² 427.04 | .51½ |
| Total..... | 40,677 | | | | | 29,912.65 | .73½ |

¹ Cost of new construction has been subtracted.

² No salary included. Bacteriological work is performed by the district health officer.

The greatest number of men employed in bacteriological work during 1915 at the main laboratory was seven, the average for the year being four. In making this average the chief of the laboratory has been considered as giving full time to diagnostic work. As a matter of fact, however, much of his time is taken up with administrative details. It is suggested that the work of a bacteriologist is in the laboratory rather than the office and, except for an occasional correspondence of a purely technical nature, such matters should be attended to by other officials of the health department.

There has also been included the work performed in the laboratory by the sanitary inspector, who devotes at least one-half of his time in the capacity of a technical assistant. It is the intention further on in this report to recommend other duties for the sanitary inspector, as it is thought that the strictly technical men now employed, namely, the chief bacteriologist and his three assistants, are ample to carry on the work at all times.

In going over the monthly expense account from the various laboratories it would seem that a good many articles are bought in the localities which had better be bought in bulk by requisition. On the 1st of January and 1st of July each year the bacteriologist in charge of the main and branch laboratories should submit a requisition for at least a six months' supply of stationery, drugs, chemicals, and laboratory supplies, those from the branch laboratories to be submitted through the chief of the main laboratory for approval.

It is also suggested that where practicable prepared culture media be furnished to the branch laboratories from the main laboratory, and that all tumor work be carried on in the main laboratory by one man skilled in pathological as well as bacteriological diagnoses.

The chief of the main laboratory should be made responsible for the technical work of each branch laboratory, but for the purpose of general administration the branch laboratories should be placed under the supervision of the assistant State health officer located in the district, and the main laboratory should be made a part of a bureau of communicable diseases.

It is questionable whether strictly clinical examinations should be made at all, certainly not where there is a private laboratory in the vicinity. If, because of local conditions, it is deemed advisable to extend certain clinical laboratory facilities to the physicians it should be done free of charge in indigent cases, and some arrangement made with the physicians whereby the State would be reimbursed if the patient were able to pay.

In the Tampa laboratory the bacteriologists are both graduate physicians, and the sanitary inspector stationed in that locality also devotes much of his time to laboratory work. The same remarks that apply to the sanitary inspector at the laboratory in Jacksonville would apply to Tampa, but in the latter place it would probably be necessary to employ a laboratory assistant if the sanitary inspector were detailed for other work. The assistant bacteriologist has had experience in water and sewage work, and it might therefore be well to remove him to Jacksonville in charge of a water and sewage laboratory, as contemplated in the formation of a bureau of sanitary engineering, substituting in his place in the laboratory a bacteriologist who need not necessarily be a physician.

The branch laboratories at Miami and Tallahassee are located in rooms provided by the city, which also furnishes the necessary heat,

light, and electricity. The city of Miami furnishes stenographic service for the bacteriologist. These two laboratories perform a good deal of the laboratory work required by the city, including milk and water analyses.

The Key West laboratory is located in a room paid for by the State board of health; the branch laboratories at Tampa and Pensacola are located in buildings owned by the State board of health.

It should be noted that the cost of maintaining the laboratories of the State board of health is approximately one-fifth of the total cost of operating the entire department, and while it is realized that a diagnostic laboratory is one of the most important divisions of public-health work, the amount expended in the present instance should certainly not be exceeded. As compared with other States, Florida has a goodly number of branch laboratories. Theoretically, at least, there can not be too many, but practically there is a limit which is certainly reached in the present instance, and the establishment of any more would be unwarranted.

Number of examinations made in the laboratories of the Florida State Board of Health, year ended Dec. 31, 1915.

| | Main (Jackson- ville). | Tampa. | Pensa- cola. | Miami. | Talla- hassee. | Key West. | Total. |
|----------------------------|------------------------------|--------|-----------------|--------|-------------------|--------------|--------|
| Intestinal parasites..... | 1,901 | 1,255 | 422 | 100 | 153 | 32 | 3,863 |
| Diphtheria (swabs)..... | 532 | 123 | 174 | 108 | 122 | 14 | 13,037 |
| Diphtheria (cultures)..... | 7,339 | 1,451 | 1,461 | 273 | 1,419 | 21 | |
| Gonorrhea..... | 750 | 504 | 475 | 90 | 61 | 22 | 1,902 |
| Malaria..... | 2,278 | 1,926 | 468 | 217 | 587 | 16 | 5,492 |
| Tumors for malignancy..... | 98 | 119 | 36 | | | | 253 |
| Rabies..... | 67 | 8 | 5 | | 7 | | 87 |
| Tuberculosis..... | 1,575 | 978 | 472 | 212 | 163 | 13 | 23,413 |
| Typhoid fever..... | 2,142 | 1,549 | 410 | 197 | 426 | 11 | 4,735 |
| Paratyphoid fever..... | 33 | | | | 52 | 1 | 86 |
| Water for colon..... | 1,025 | 158 | 61 | 282 | 37 | 10 | 1,573 |
| Water, chemical..... | 875 | | | | | | 875 |
| Leprosy..... | 5 | 4 | | | | 1 | 10 |
| Ophthalmia neonatorum..... | 10 | 31 | | | | 1 | 42 |
| Rats examined..... | | 1,525 | | | | 668 | 2,193 |
| Milk analyses..... | 175 | 3 | 155 | 776 | 29 | | 1,138 |
| Urine analyses..... | 159 | 245 | 88 | 42 | 87 | 4 | 625 |
| Blood counts..... | 173 | 120 | 111 | 24 | 80 | 7 | 515 |
| Animal inoculations..... | 37 | 16 | 8 | | 3 | 1 | 65 |
| Miscellaneous..... | 534 | 85 | 17 | 74 | 55 | 8 | 773 |
| Total..... | 19,708 | 10,100 | 4,363 | 2,395 | 3,281 | 830 | 40,677 |

¹ Includes examinations for carriers and of release cultures.

² Includes reexaminations.

Field Force, Active and Potential.

The State board of health is fortunate in having in its employ a field force for public-health work. The personnel of this force and their respective salaries are at present as follows:

| | |
|---|---------|
| 4 assistants to the State health officer, at \$2,400..... | \$9,600 |
| 3 assistants to the State health officer, at \$2,000..... | 6,000 |
| 3 county agents (part time), at \$600..... | 1,800 |
| 6 public-health nurses, at \$1,200..... | 7,200 |
| 4 sanitary patrolmen, at \$1,200..... | 4,800 |
| Total..... | 29,400 |

District health officers.—For several years previous to 1913 there were employed four assistants to the State health officer. One was detailed to headquarters and three were detailed to field work. In 1913 the State was divided according to density of population and facilities of transportation into seven districts, and four more assistants to the State health officer were appointed, thus making seven medical assistants in the field, or one to each of six districts, and one for the State at large, while the bacteriologist appointed for work in the branch laboratory in the remaining district was detailed to act in the capacity of the assistant to the State health officer in the district. His duties, however, have been confined almost entirely to the laboratory.

The district health officers are expected to make an inspection trip through their districts at least three times each year. If an emergency arises the officer in whose territory it occurs is detailed to make an investigation and when necessary to institute preventive measures for the control of the disease. Blank forms have been devised for the purpose of submitting epidemiological data by attending physicians or data gathered during investigations of smallpox, typhoid fever, diphtheria, scarlet fever, rabies, and pallagra.

Upon the request of local authorities sanitary surveys are carried on and expert advice is given.

Upon the completion of any investigation or inspection a report is submitted to the State health officer.

The assistants to the State health officer are required to deliver popular lectures as the occasion arises. One assistant has been especially active along these lines in that he gives a course in public health in high schools. This course has been made a part of the regular curriculum and the pupils are required to pass an examination on the subject at the end of the term. This is a very excellent idea and should result in great good.

County agents.—The county agent is a remainder from the old system in vogue before the position of assistant State health officer was created. The activities of the county agents are limited to the county and to a large extent are confined to the principal city in the county. They are part-time employees and are expected to perform in their respective counties the same duties that are performed by district health officers.

Public health nurses.—The public health nurses of the State board of health began their work less than a year ago. There are now actively engaged in field work six nurses, each having a district. At a recent meeting of the State board of health the State health officer was authorized to employ six additional nurses. This will require the subdivision of the State into 12 districts instead of six as at present. It is the intention to utilize, as soon as possible, the services of the nursing staff for all classes of public health work in which it

may engage, though last year the nurses' duties were mainly concerned with tuberculosis, their visits being made only to houses from which tuberculosis had been reported. At these visits they give not only instructions as to the care of tuberculous patients and the means of prevention, but advice and instruction on other health matters as well. A number of talks have been given before women's clubs and other organizations.

For the part of the year 1915 in which these nurses were employed they visited a total of 1,225 cases of tuberculosis.

When a case of tuberculosis has been seen for the first time, it is reported to the State board of health and a card is filled in with full data relative to the social conditions of the patient; "follow up" reports are forwarded at each subsequent visit. A monthly report of her activities is required from each nurse. Upon her arrival in a community the physicians are first visited and interviewed with reference to any tuberculous patients whom they may be attending, the purpose of the antituberculosis work of the State board of health is explained, together with the methods of procedure, and the cooperation of the physicians is requested.

Sanitary inspectors.—The duties of the sanitary inspectors are not unlike those performed by men in similar positions elsewhere, except that two of them spend much time in the laboratory assisting in routine work. Many of the duties of the sanitary inspectors are performed in the municipality in which the district health officer has his headquarters.

Discussion.—It is unfortunate that some of the assistants to the State health officer are engaged in the private practice of medicine. All experts will agree that private practice and the work of the health officer are incompatible.

Potentially this force is capable of performing an amount of public health work of incalculable value to the State of Florida. Actually, however, there is not sufficient field work of an important and intensive nature accomplished. There is too much time spent at headquarters. The representative of the State board of health is at times too apt to limit his duties to the locality in which he resides, performing work that should be done by a municipal health department. This limited sphere of action is partly due to the fact that the funds of the State board of health will not warrant too large an expenditure for traveling expenses. This obstacle, however, must be overcome, even though it may be necessary to economize in other directions, for in order to get the valuable results that may be expected, the field men must be active in the field. The small municipality and rural districts are in greater need of State aid than is the larger municipality which should be equal to taking care of itself. There are many public health problems in the State requiring thorough epidemiological investigation, and it is strongly urged that intensive

studies be carried on as to the prevalence and eradication of malaria, typhoid fever, dysentery, infant mortality, pellagra, tetanus, trachoma, and other similar conditions within the State. That such work may be performed to the best advantage it should be understood that each district health officer must give his full time to the State and not engage in private practice or any other business that will interfere with his official duties.

Number of investigations made by the assistants to the State health officer, outside of the cities comprising their headquarters, year ended Dec. 31, 1915.

| District. | Diphtheria. | Small-pox. | Typhoid fever. | Scarlet fever. | Other preventable diseases. | Sanitary inspections, lectures, etc. | Sanitary surveys. | Total. |
|---------------------|----------------|------------|----------------|----------------|-----------------------------|--------------------------------------|-------------------|--------|
| Southwestern..... | 3 | 3 | 2 | ..... | 3 | 20 | 2 | 33 |
| Western..... | 1 | ..... | ..... | ..... | 2 | ..... | ..... | 3 |
| South tropic..... | ..... | 4 | ..... | ..... | ..... | 2 | ..... | 6 |
| South central..... | 5 | 6 | 2 | 3 | 6 | 9 | 1 | 32 |
| Central..... | ¹ 5 | 9 | 2 | ..... | ² 22 | ³ 17 | 2 | 57 |
| East coast..... | 5 | 3 | 3 | ..... | ..... | 35 | ..... | 46 |
| West central..... | 1 | 1 | ..... | ..... | 3 | ..... | 2 | 7 |
| State at large..... | 4 | 1 | 5 | 1 | 9 | 20 | 6 | 46 |
| Total..... | 24 | 27 | 14 | 4 | 45 | 103 | 13 | 230 |

¹ 1 investigation made in east coast district.

² 15 investigations made in the western district.

³ 1 investigation made in south central and one in the western district.

It is suggested that the position of county agent be abolished and that the county be included in the district to which it logically belongs.

It is likewise suggested that the nursing staff be increased as funds will permit, so that each nurse in time will have a small district in which she may carry on all of the duties required of her, including the activities concerned with antituberculosis and other communicable disease nursing, child welfare and prenatal nursing, school nursing, and the supervision of midwives.

It is suggested that much more good could be obtained from the service of the sanitary inspectors if they were given some specific duties to perform. In the present instance they might be transferred to a division of dairy inspection, which should be created in the veterinary division, and given the duties involved in the inspection of milk-producing establishments when such places are not operated under the supervision of local authorities. This would mean that they would require a thorough preliminary training along that line.

It is pointed out that it would be more businesslike to form each district into a health unit to be in charge of the district health officer, who should have as his assistants those public-health nurses working within the district, and the general administrative control of the branch laboratory, where one is established, together with a general supervisory control over local health authorities.

In order to enable the field force to cover more territory in a more expeditious manner and in a way that would eventually prove

economical, each district health officer and nurse should be provided with an inexpensive runabout.

The undue morbidity of the State of Florida is chargeable in large part to the ignorance and lack of right living on the part of the negro population; it is therefore obvious that the work of the health officer is required among the negroes as well as among the whites. The preventable diseases are no respectors of color and preventive measures should be applied among the negro race, not only to prevent the spread of disease to the white population, but also to conserve the life and health of the laboring class of the South, upon whose physical fitness many of the industries depend. It would, therefore, be desirable to appoint some colored nurses in the State board of health who can carry on work among their own people to advantage.

Local health authorities.—No county in the State has a health organization of any kind, and there are only two cities in the State having a health department worthy of the name—Jacksonville and Miami. In the other larger cities, as well as in some of the smaller municipalities, there is a part-time health officer whose duties are not onerous. Too much dependence is placed upon aid received from the State, especially in those communities forming headquarters for the assistants to the State health officer. Such a condition is inconsistent in a growing and prosperous community.

Jacksonville.—The health organization of Jacksonville is controlled by a board of health, which has as its executive officer a full-time health officer.

The board of health expended in 1914, \$42,466.44. The financial statement for 1915 has not been completed, but the appropriation for that year amounted to \$36,690, while the total available money for public-health work during 1916 will amount to approximately \$41,152.

The activities of the Jacksonville board of health comprise the health supervision of schools, the control of communicable diseases, infant welfare work, the recording of births and deaths, milk and dairy inspection, including a laboratory, sanitary inspection, mosquito extermination, and the disposal of night soil.

To carry on the work required in a health supervision of schools there are employed two doctors at \$50 per month, both part-time men, and two nurses giving their full time to the work, at \$75 per month. The inspection is made among the white pupils only. During the year 1914 the total cost of this work amounted to \$2,680.27.

For the inspection of milk and dairies there is employed one inspector who, though not a veterinarian, is a graduate of a school of dairying and has had practical experience in the business.

An inspection of some of the producing farms supplying milk to Jacksonville shows that much has been accomplished toward improv-

ing sanitary conditions, not by requiring the installation of expensive equipment, but by teaching the principles of cleanliness, as applied to milk production.

Maintained in conjunction with this division there is a laboratory in which there is employed a bacteriologist and chemist, who receives \$2,100 a year. The principal work of the laboratory consists of the examination of milk samples. In addition to this, analyses are made of the city water supply and a small amount of diagnostic work is performed, especially in the case of diphtheria. Most of the diagnostic work, however, is done in the State laboratory. The analyses of milk samples show that there is a constant improvement in the cleanliness of the milk, as shown by the bacterial count. To support the milk inspection division, including the laboratory, during the year 1915, cost \$3,807.29.

The city board of health owns and controls a modern isolation hospital, which is operated and maintained by the general hospital of the city. The isolation hospital is far superior to most institutions of its kind, and the city of Jacksonville is fortunate in having such excellent hospital facilities for isolating the communicable diseases according to modern ideas.

The registration of births and deaths in the city of Jacksonville is highly efficient and is in the immediate charge of the secretary of the city board of health.

In addition to the two school nurses who perform not only school nursing but nursing in connection with the communicable diseases as well there is employed by the health department one colored nurse who works among the colored population, maintaining a supervision over the negro midwives, and performing work along educational lines and to prevent the spread of the communicable diseases. In addition, the infant welfare society of the city employs a nurse who works under the supervision of the health officer, and there are two nurses employed by private charity who work independently of the health officer. The board of health plans to add two more nurses to its staff in the very near future, after which it is expected that there may be effected an amalgamation of the nursing forces of the city so that it will be possible for them all to work under one head, the health officer, and that the districts will be small enough to enable a nurse to perform all public-health activities required in her respective district. Such an arrangement would be in accordance with modern views and would mean increased efficiency.

There are 15 sanitary inspectors at \$85 a month and one chief inspector at \$150 a month. One of these inspectors is detailed for the inspection of hotels and restaurants; one acts as fumigator, placards houses, and investigates special complaints; and one acts as assistant chief. The others are engaged in general sanitary

inspections. The cost of maintaining the sanitary inspection division in 1914 was \$17,713.

Engaged in the operation of mosquito extermination there are three men employed at a total of \$2,341 per year. Expenses for oil, etc., for 1914 were \$618.87, making a total of \$2,959.87. In addition to this, two creeks in the city are kept free of weeds by contract, at a cost in 1914 of \$350.

The scavenger collecting the night soil pays the city for that privilege and collects his fee from the householder. In this way the board of health receives \$2,712 per year, which may be used for public-health purposes. The night soil is dumped into one of the city sewers at a station especially equipped for the purpose. The board of health employs two men at this station at a cost of \$1,000.

The board of health maintains a free dispensary, employing a pharmacist and three city physicians at \$900 a year each for part-time services.

There are furnished free of charge prophylactic packages, to be used against infantile tetanus and ophthalmia neonatorum. Midwives are instructed, examined, and licensed by the city board of health. This, together with the use of the prophylactic packages and the activities, more especially of the colored nurse among the midwives of her race, has been instrumental in decreasing the amount of infantile tetanus and ophthalmia neonatorum to a very marked degree.

The board of health furnishes to the dairy inspector an automobile as well as a machine, which is used jointly by the health officer and the chief sanitary inspector. For mosquito extermination there are furnished two wagons and two mules. Employees of the department ride free on the street cars.

The collection and disposal of rubbish are under the control of the board of public works. An ordinance requires that householders place their rubbish in a proper receptacle and specifies that no garbage may be mixed with it. There is no provision made, however, for the collection of garbage. The householder is required to dispose of this refuse as best he may, and it is usually collected by the farmers who feed it to the hogs. As a result of this unfortunate condition the householder frequently surreptitiously places his garbage in the rubbish can.

The rubbish is used for filling in low places, a legitimate and economical procedure provided the rubbish contains no garbage.

The city should make provision without delay for the collection and disposal of garbage according to the methods pursued in modern cities, requiring the householder to have two cans, one for garbage and one for rubbish, the garbage to be disposed of by means of incinera-

tion or in a modern reduction plant. The collection of garbage and rubbish can be made on alternate days and if the wagons are properly constructed they may be used to collect both rubbish and garbage.

The city water supply is from flowing wells. It is treated with hypochlorite because there has been found evidence of contamination derived either from seepage through cracks in the aeration reservoir or from the dust of the streets, the reservoir being uncovered.

The city of Jacksonville has an efficient health organization. It should be pointed out, however, that the number of sanitary inspectors employed as compared to nurses, keeping in mind the relative importance of the work performed, is out of all proportion and unnecessary. It would be better to reduce the number of sanitary inspectors and employ more nurses.

Miami.—The city board of health employs a health officer who is permitted to do some private practice. He has under him a milk inspector who is a veterinarian, a plumbing inspector, and a clerk.

Garbage is collected by the city health department. Cans are furnished free of charge to each householder. They are collected and taken to the incinerator, dumped, flushed, and steamed. A clean can is substituted for the one collected. The system is highly satisfactory and carried out efficiently.

Milk inspection is thorough and has resulted in a great improvement in the dairies supplying milk to Miami.

The collection of birth and death reports seems to be satisfactory, but the city is not in the registration area.

The water supply is secured from deep wells, but has showed some evidence of pollution and is therefore being treated with hypochlorite of lime.

The city is sewered, the sewage emptying into the bay untreated.

Laboratory work is performed by a branch laboratory of the State board of health.

A visiting nurse employed by the relief association cooperates with the health department.

The other cities visited had such poor local health organizations that it is not thought worth while to attempt any description.

Except in Key West the water supplies are all derived from deep wells. In Key West rain water is used, attempts to drive wells having been unsuccessful.

With the exception of Key West all the cities visited were sewered in whole or part. In Tampa, sewage is treated by three Imhoff tanks located in different parts of the city. In Tallahassee it is treated by septic action and percolated through coke beds. In both Tampa and Pensacola provision is made for milk inspection. In the former city,

however, inspection is done by the division of food and drugs, which is not a part of a health organization.

A word should be said relative to the division of sanitation in Tampa. The chief of this division is in charge of street cleaning and the collection of garbage and rubbish. He takes great interest in the work and manages affairs efficiently and economically, but in order to keep up with the growth of the city he requires an increased appropriation.

Garbage is incinerated, there being four incinerators of two units each, with a capacity of 100 tons. There is collected an average of 48 tons of garbage per day though the collection at times may greatly exceed this amount. To incinerate costs about 38 cents per ton. No figures were available for the cost of collection. The division of sanitation employs sanitary inspectors.

PUBLIC HEALTH ENGINEERING.

The State board of health has never established any bureau of public health engineering nor has it ever had in its permanent employ a public health engineer. Assistance has been obtained from the outside from time to time as the occasion arose and the service paid for as required.

Requirements of laws.—The laws relating to public health engineering are summarized as follows: It is prohibited to deposit any rubbish, filth, or other deleterious substances liable to affect the health of persons, fish, or live stock in any of the waters of the lakes, rivers, streams or ditches in the State. For violation there is provided a fine of not to exceed \$500. The enforcement of the law is placed with the State board of health.

It is prohibited to use any cavity, sink, driven or drilled well for the purpose of draining any surface water or discharging any sewage into the underground waters of the State, without first obtaining a written permit from the State board of health. For violation there is provided a fine of \$25 for each offense or imprisonment not to exceed one month or both. Each day during which the act is violated constitutes a separate offense.

It is unlawful for any person to maintain a surface closet within incorporated limits, which is not fly proof in construction, and is not built in conformity with plans approved by the State board of health.

For violation there is provided a fine of not to exceed \$10.

The State board of health is authorized "to employ or engage the services of a sanitary engineer * * * whenever in the opinion of the State health officer the necessities of sanitation in and about the State may require an expert opinion and decision in regard to construction of sewers, drainage of a sanitary character, etc." The law further provides that the sanitary engineer "shall only be employed at such times and such periods as in the judgment of the State health officer, his expert services may be required."

Discussion.—It has been suggested on several occasions to retain the services of an engineer or firm of engineers in private practice who could act, when needed, for the State board of health. To put the proposed arrangement into effect a retaining fee would be necessary and actual work paid for at the rate of \$25 a day and expenses.

The scheme would not be satisfactory, would not be consistent with the practice in modern health departments and would prove in the end an expensive procedure. There are so many communities in the State with problems of water supply and sewage or garbage disposal, which for their solution require the advice of an expert, that the services of a full-time official could be employed to great advantage. His duties would be to study thoroughly the conditions in a community and to inform the authorities what should be done to best meet the requirements; to estimate the probable cost of construction; to approve all plans presented by the constructing engineers employed by the locality; and by advice and supervision to determine that the locality is getting all that it is paying for. It is entirely too common to find a small city supplied with a sewerage or water system entirely inadequate for the purpose, solely because sound advice was not obtained beforehand.

The legislation relating to the disposal of sewage and maintenance of the purity of water supplies is very meager, but even with little authority the State engineer could render services of inestimable value to the locality because of the advice he would be able to give, at the expense of the State. In time, after the establishment of a bureau of public health engineering and the employment of a sanitary engineer, it would be advisable to give him assistance; as, for instance, a draftsman and a water and sewage analyst.

DISSEMINATION OF INFORMATION.

The activities carried on for the dissemination of information on the subject of public health, including publications and exhibits, might well be considered more highly specialized than any other work of the State board of health. During the year 1915 there were spent for educational purposes \$13,408.11. Funds spent in this way may be considered money well invested.

Requirements of law.—The law relating to the subject of education along public health lines is summarized as follows:

The State board of health is authorized to disseminate information concerning the cause, nature, and extent of communicable disease and may arrange for free lectures and health exhibits and the publication and distribution of bulletins, pamphlets, circulars, or other printed matter.

The State board of health is further authorized to send a public health exhibit in a railway car or cars over the different lines of railroad in the State and to give free illustrated lectures to the people. The State health officer may employ a sufficient number of assistants to carry on the work.

The railroad companies may haul the cars free of charge and furnish free transportation to the necessary number of employees.

The State health officer is authorized to accept any donation and contribution that may be made by any local government to assist in defraying the expense of the exhibit in the locality.

The personnel of the State board of health at present engaged in strictly educational activities, and their salaries, are as follows:

Exhibit:

| | |
|--|---------|
| 1 assistant to the State health officer..... | \$1,200 |
| 1 cook..... | 520 |
| 1 porter..... | 520 |
| 1 engineer..... | 520 |

Publications:

| | |
|---|-----|
| 1 publicity agent (press service, part time)..... | 300 |
|---|-----|

3,060

Publications.

Monthly bulletin.—There is a bulletin issued monthly and distributed to some eight thousand people, including physicians and other citizens, to newspapers of the State, and officials in Florida and other States. This bulletin contains statistics on health matters derived from the reports received by the division of "vital statistics," and original or other articles pertaining to the prevention of disease and personal hygiene. The bulletin is full of excellent material, but like other publications of its kind, unfortunately reaches but few of those people most in need of instruction.

Pamphlets.—A large number of publications of this nature have been issued from time to time by the State board of health, and cover a wide range of subjects, including hookworm disease, malaria, mosquitoes, flies, smallpox, Imhoff tanks, antityphoid vaccination, tuberculosis, vital statistics, water purification, measles, child welfare, ophthalmia neonatorum, typhoid fever, and preventive medicine in general. Some of these pamphlets are original and some reprints from other sources. All are worthy of perusal and make a valuable addition to a library of popular information on public health subjects.

These pamphlets are sent to the same individuals who receive the monthly bulletin but in addition are distributed from the exhibition train, as well as by the field officials of the State board of health during their various trips. In this way they have a much wider circulation and reach a more varied population.

Circulars of information.—Circulars of information have been published on the subjects of malaria, consumption, hookworm, typhoid fever, pellagra, whooping-cough, flies, and sanitary privies. These circulars are small and contain in a few words the essentials of the subject. They are intended more especially for general distribution from the health train and by the public health nurses in their house to house visits, supplementing instructions given verbally.

Posters.—A number of instructive posters have been issued from time to time by the State board of health from original or other

sources. Some were intended for posting in public places while others have been used exclusively for reproduction in the various publications of the board and for exhibition on the health train. They are all drawn in the health department by an artist employed as the occasion arises.

Press service.—There is written each week a popular article on some subject of public health which is sent gratis to every newspaper in the State, with the request that it be published in the interest of the public health. These articles are composed by a part-time employee of the State, of long experience in newspaper work, and are therefore written in the style that may be appreciated by the general reader.

Exhibits.

In the past the public-health exhibit of the State board of health was sent from place to place by freight or express. This necessitated the packing and unpacking of the exhibit each time it was shown, a cumbersome and expensive procedure and one limiting the number of localities visited. During the last year, however, three cars were purchased from the Pullman Company and remodeled, one as a living car and two as exhibit cars. The railroads of the State have agreed to haul this train from place to place free of charge, together with the necessary number of attendants. This arrangement was made possible through the action of the State legislature and the Interstate Commerce Commission.

The living car, designed to house the officials in charge of the exhibit, is well planned and contains a kitchen, dining room, four bed rooms, and an office and living room. In this car there are two bath rooms and toilets, with a wash basin and dental lavatory in each bedroom. Pressure tanks are provided for storing the water supplied to the different plumbing fixtures.

The second car contains bunks, toilet and bathing facilities for the train crew, a gasoline engine, and an electric generator which furnishes all of the light and power used on the train. About two-thirds of the space in this car is utilized for the exhibition of models, charts, etc., and projecting apparatus. A compartment has been rendered fireproof and contains the moving-picture machine. The screen is erected outside of the car when required and the picture projected through the open window.

The third car, except for a small compartment containing a public toilet, is devoted entirely to exhibits, especially charts and panels containing in terse phrases the essentials of preventive medicine.

Each car is screened against flies and mosquitoes and provided with electric fans, so that adequate ventilation may be secured.

Beneath each toilet there is a screened can, so that pollution of the tracks, especially at sidings or stations, may be prevented. These cans are cleaned by the laborers employed by the railroads at the various stations. Journals are inspected by the regular car inspectors, and in most instances both ice and water are furnished by the railroad company free of charge.

Among the models shown are the "Flies' air line," a sewage-disposal plant; the way in which underground contamination of water supplies may occur; an open-air house for the tuberculous; "The contrast room illusion;" the comfortable infant; and others. These models will be added to from time to time until all available space is filled.

Practically all of the towns of Florida have railroad facilities, so that by reason of the cooperation of the railroad officials this train will be able to reach every community. It is, in fact, the people of the small community that are most in need of instruction, and it is satisfactory to note that they have shown great interest in the exhibit, many times even 90 per cent of the population taking advantage of the opportunity to see it.

The official of the State board of health in charge of the exhibition train is assisted by the various district health officers who accompany the train during the time that it remains within their respective districts.

It has been thought more businesslike and satisfactory to all concerned to operate the train on regular schedule, visiting each community in a methodical manner. Many requests have been received by the State board of health to send the exhibition train to various places during county fairs and the like, but compliance with these requests would not only interfere with the schedule, meaning long, irregular trips, but would impose an extra burden on the railroad companies as well.

Discussion.

The activities on the part of the State health officer for the education of the people along lines of public health and sanitation are excellent and should, in time, result in great good. The work is of such great importance that it is deemed worthy of a special place in the health organization, and it is therefore suggested that a bureau of public health education be formed with a full-time chief to have complete charge of all matters pertaining to publications and exhibits.

The criticism that so many of the people in need of instruction do not read or even see the published articles is probably too true.

It is in fact almost futile to attempt to teach the present generation, and it is thought that greater progress would be made if special

instruction could be given to the younger generation. It is therefore suggested that in order to reach the children the State board of health publish semimonthly articles on preventive medicine to be used in the public schools as texts for the lessons on hygiene and sanitation. The hearty cooperation of the teachers in the public schools would be necessary to insure success.

HEALTH SUPERVISION OF SCHOOLS.

Requirement of laws.—During the 1915 session of the legislature a law was enacted providing for a health supervision of school children which was placed for its enforcement in the State board of health. It is summarized as follows:

All school children must be examined as to their physical condition at least once during each school year. To accomplish this, the State board of health is authorized to promulgate the necessary regulations.

County physicians must act as medical inspectors of school children, and where there is no county physician, the county commissioners must appoint a physician for that purpose. The State board of health is required to pay for the services rendered by county and other physicians appointed to carry on the work. The law also specifies that no one school physician may have more than 2,500 school children under his charge. The provisions of the act do not affect cities of over 5,000 inhabitants where a system of medical inspection of school children has already been established by the city board of health, provided that the authorities carrying on the work adopt the forms prescribed by, and make full reports to, the State board of health.

In addition to the above, a law requires that all school buildings, public or private, be provided with either water or surface closets, having separate compartments for each sex. Where water closets are not practicable, surface closets must be fly proof and constructed in conformity with plans approved by the State board of health. For failure to install the proper closets there is provided a fine of not to exceed \$50.

Methods of procedure.—It has been estimated by the department of public instruction that the total enrollment of pupils for the school year 1915-16 is 191,240. Of this number 12,190 are in the high schools and 179,050 in the lower grades. To examine these children according to law, there would be required approximately 76 physicians. As the act did not carry with it any appropriation it is impracticable for the State board of health to pay salaries commensurate with the importance of the work. However, as some action had to be taken it was decided that reimbursement be made to the extent of 10 cents for each child examined. Even this small sum would mean an annual expenditure of approximately \$19,000 for medical services alone.

Regulations were promulgated by the State board of health to carry out the provisions of the law, and the medical inspection of school children commenced about the first of the present year, 1916.

The examining physician is required to record the results of the examination of each child on a separate card and file the same in his

office. This card follows the child throughout the period of school life.

When the physician has completed the examination of the children in his district he submits to the State board of health a report showing the number of pupils examined, the name of the school, the nature of the defects found, the number of pupils vaccinated, and other pertinent information.

Discussion.—The law as passed was not recommended by the State board of health and does not seem to have been framed with a full understanding of the requirements for a State-wide health supervision of school children. In the first place the most important factor in a system of health supervision, the school nurse, has been overlooked; also the fact that the State board of health has in its employ seven medical men whose services could be used without extra expense for the examination of children in the small municipalities and rural districts. As in other health matters the health departments of the larger municipalities should be under the obligation of assisting the State by employing their own medical inspectors.

Better results would accrue if the funds of the State board of health devoted to school work were expended in the employment of more nurses. The nurse can detect not only many defects in the children which it may or may not be necessary to refer to the physician, but she can go further and follow up the case into the home. A medical inspection without a follow-up system is useless.

Again, the law makes it necessary to examine all children at least once each year. This matter should be left to the discretion of the examiners. As a usual thing pupils of the high school do not require an examination. Children found without defects at the first examination usually do not require a reexamination.

The payment of expenses has been placed with the State board of health, although that board is not permitted to select the examining physicians.

While the law is very defective, it is a step in the right direction and will result in securing valuable statistics proving the great necessity for some health supervision over the school child.

It is thought highly desirable to amend the law at the next meeting of the legislature, so that the district health officers now employed by the State board of health may perform much of the medical work, the nursing staff of the State board of health be greatly increased, and certain other changes be made as already suggested.

As soon as practicable it would seem advisable to carry on work along the lines of child welfare, and for this purpose a bureau of child welfare should be organized into which could be incorporated the health supervision of schools and the supervision of midwives.

VETERINARY DIVISION.

The veterinary work of the State of Florida is performed by an organized division of the State board of health. The personnel of the veterinary division and their respective salaries at present are as follows:

| | |
|--|---------|
| Veterinarian of the State board of health..... | \$2,000 |
| 1 stenographer..... | 720 |
| 1 assistant veterinarian..... | 1,800 |
| 1 live-stock agent..... | 1,500 |
| 1 live-stock agent (part time)..... | 300 |
| Total..... | 6,320 |

In addition to the above there are appointed a number of veterinary inspectors in different parts of the State who receive compensation from the owners of animals inspected. Their duties consist mainly of a supervision over the shipment of horses and mules, with special reference to the presence of glanders.

The work of the veterinary division is concerned with all that its name implies, but more especially with tick eradication, hog cholera, glanders, and tuberculosis.

The problem of the eradication of Texas fever has been a serious one in Florida, and this disease has greatly interfered with the growth of the cattle industry.

The veterinary division of the State board of health has been energetic in its efforts to secure tick-free zones from which shipments of cattle might be made in compliance with quarantine regulations of other State and Federal authorities. To accomplish these results the hearty cooperation of the owners and the authorities in the locality is required. Dipping vats must be built by private capital and regulations looking toward the eradication of the disease adequately enforced. So far, but two counties of the State, Dade and Broward, have eradicated the tick and will soon be declared tick-free. There is, however, a constantly increasing interest taken in this work, resulting in the construction of more dipping vats in various parts of the State. The State veterinarian has delivered a number of addresses before gatherings interested in the subject of tick eradication.

The eradication of hog cholera has also been a serious problem requiring a large expenditure of money for hog cholera serum, which according to an act of the legislature must be issued free of charge to farmers by the State board of health.

Horses and mules are not permitted to enter the State without a certificate to the effect that they have been given the mallein test and are free from glanders. In this as well as in other matters the railroad companies give their hearty cooperation.

The reimbursement for horses and mules killed within the State on account of glanders is allowed by law in a sum not to exceed \$75. The value is determined by a board of three members, consisting of the State veterinarian or his agent, a person appointed by either of them, and one appointed by the owner.

Bovine tuberculosis is not at present a serious problem within the State, due perhaps to the small number of cattle distributed over a wide territory and the open-air life, nor has the veterinary division carried on very extensive work as regards the tuberculin testing of cattle; it may be done upon request. Certain of the cities have enacted ordinances requiring that this test be made in the milch cows and in carrying out this ordinance may receive State aid if they desire it. A law prohibits the importation of cattle, except for immediate slaughter, unless the tuberculin test has been applied and they have been found free from tuberculosis.

CONTROL OF THE MILK SUPPLY.

No State body is at present exercising any supervision over the milk supply, nor are there any State laws or regulations applying to the subject, except that clause in the pure-food law which defines a chemical standard for milk. As has already been pointed out, some of the municipalities have employed a milk inspector for the inspection of milk-producing farms in the locality and the milk after it has arrived within corporate limits. This important field of public-health work should be immediately taken up by the State board of health with a view towards maintaining a sanitary condition in milk-producing farms not at present being supervised by local authorities and improving the cleanliness of the product. For the purpose there should be established in the veterinary bureau a division of milk inspection. This would necessitate the employment of inspectors to carry on the field work. Such men should be trained in dairy farm inspection. The score card used by the United States Department of Agriculture may be adopted, and regulations providing for the maintenance of cleanliness on dairy farms should be promulgated by the State board of health.

As before stated, the inspectors at present employed for general sanitary work might be transferred to the milk-inspection division as dairy-farm inspectors. It must be kept in mind that the men employed in this class of work should be intelligent and must have a personality permitting them to associate with the farmer on amicable terms, for, after all, the inspector is essentially an educator and the necessary control amounts to a friendly cooperation between him and the milk producer. The State board of health is already well equipped to handle the veterinary side of the question.

THE TREATMENT OF CRIPPLED CHILDREN.

In 1911 the State legislature passed a law authorizing the State board of health to erect a hospital for, and to furnish free treatment to, indigent crippled children of the State. To provide the necessary money the legislature authorized the use of \$20,000 to be paid out of funds already available to the State board of health. As the State board of health was already making use of its funds for activities already under way the hospital in question was not built. However, a provision of the law permitted the State board of health to care for crippled children in an institution already established until the number of applicants for treatment would warrant the erection of a hospital for the purpose. Accordingly, arrangements were made with two Jacksonville institutions to furnish the necessary care, and the physician furnishing treatment was last year placed on the pay roll of the State board of health at a salary of \$1,500 a year.

The work involved is essentially charitable in nature and has only indirect bearing on the public health.

MISCELLANEOUS.

Hotel inspection.—Previous to the year 1913 the inspection of hotels was one of the duties of the State board of health. Since that time, however, the legislature has created the office of hotel commissioner and enacted a comprehensive law for the maintenance of sanitation in hotels, and providing for the safety and comfort of the guests. The hotel commissioner has promulgated a number of regulations to carry out the provisions of the act. This law is similar to hotel inspection laws in other States, and will not be summarized here.

Abatement of nuisances.—It is made the duty of the State health officer, upon request of the proper authorities or three responsible resident citizens, or whenever it may be deemed necessary by the president of the State board of health or the State health officer, to investigate sanitary conditions of any city or town or place in the State and if a "sanitary nuisance" be found, it becomes his duty to notify the proper persons to remove or abate the nuisance within 24 hours or within such time as he may deem reasonable, and if such notice is not complied with, the State health officer is authorized to remove or abate it and charge the expense against the person committing the nuisance.

Certain other provisions of law prohibit the keeping of hogs within the limits of any city or town of over 2,000 inhabitants; regulate the maintenance of slaughterhouses; prohibit the importation or sale of diseased animals, and the depositing upon any premises, streets, etc., of any offensive substances, as, for instance, stable manure, decayed animal or vegetable matter, etc.

Statement of expenditures of the State board of

| | Board of health. | Administration. | | | | | Epidemiological. |
|---|------------------|--------------------------|-------------------|-----------------------|-----------------|---------------|-------------------------|
| | | Office of the secretary. | General expenses. | Building and grounds. | Clerical. | Library. | Field medical officers. |
| Ammonia for ice machines..... | | | | | | | |
| Animal food..... | | | | | | | |
| Animals, laboratory..... | | | | | | | |
| Antitoxins and vaccines..... | | | | | | | |
| Attorney's fees..... | | | \$25.00 | | | | \$1,782.95 |
| Books, periodicals, and reprints..... | | | 30.00 | | | \$390.34 | |
| Charts, maps, plans, etc..... | | \$2.25 | | | | | 52.20 |
| Containers, mailing outfits, etc..... | | | | | | | |
| Drugs, chemicals, and disinfectants..... | | | | | | | |
| Dues to societies and associations..... | | | 20.00 | | | | |
| Electrical supplies..... | | | 11.75 | | | | |
| Emergency services..... | | | | \$23.30 | | | |
| Express, freight, and drayage..... | | | 119.14 | | | | 1.90 |
| Furniture..... | | | | | | | |
| Gasoline..... | | | | | | | |
| Glanders, reimbursement for..... | | | | | | | |
| Grounds, care of..... | | | | 263.18 | | | |
| Heat, water, and electricity..... | | | | 396.39 | | | |
| Hospitals, maintenance of patients, including supplies and apparatus..... | | | | | | | |
| Household furnishings and supplies..... | | | | | | | |
| Installation of equipment..... | | | | | | | |
| Insurance, buildings, and fixtures..... | | | 5.00 | | | | |
| Laboratory supplies..... | | | | | | | |
| Laundry..... | | | 13.50 | | | | |
| Mimeograph and repairs..... | | | 4.50 | | | | |
| Miscellaneous..... | \$73.25 | | 80.80 | .25 | | | 12.00 |
| Models and repairs..... | | | | | | | |
| Moving-picture machine and films..... | | | | | | | |
| New construction..... | | | | 176.60 | | | |
| Office supplies..... | | | 43.55 | | | | 5.95 |
| Pellagra treatment..... | | | | | | | 132.01 |
| Photograph cuts and X-ray plates..... | | | 122.55 | | | | |
| Press clippings..... | | | | | | 60.00 | |
| Printing..... | | | 1,060.67 | | | 4.50 | 29.24 |
| Registrars' fees..... | | | | | | | |
| Reimbursement, care of indigent smallpox patients..... | | | | | | | |
| Repairs and alterations..... | | | | 173.17 | | | |
| Repairs to apparatus..... | | | | | | | |
| Rent..... | | | | | | | 252.00 |
| Salaries..... | 630.00 | 4,999.92 | | 954.00 | \$5,090.11 | | 16,933.08 |
| Scientific instruments and apparatus..... | | | | | | | |
| Screening..... | | | | 2.50 | | | |
| Signs..... | | | | | | | 13.00 |
| Stamps, post-office box..... | | | 540.91 | | | | |
| Stationery..... | 39.65 | | 483.90 | | | | 28.55 |
| Stereomograph and slides..... | | | | | | | |
| Telegraph and telephone..... | | | 486.30 | | | | |
| Transportation indigent smallpox patients to isolation hospitals..... | | | | | | | |
| Traveling expenses..... | 207.40 | 2,314.90 | | | | | 2,260.25 |
| Typewriters and repairs..... | | 40.05 | | | 177.21 | | |
| Vaccinations..... | | | | | | | |
| Total..... | 950.30 | 7,357.12 | 3,047.57 | 1,989.39 | 5,267.32 | 444.84 | 21,503.16 |

health of Florida for the year ended Dec. 31, 1915.

| Epidemiological. | | Health supervision of schools. | Sanitation. | Education. | Vital statistics division. | Treatment of crippled children. | Veterinary division. | Laboratories. | Total. |
|--|---|--------------------------------|-------------|------------|----------------------------|---------------------------------|----------------------|---------------|------------|
| Public health nurses, including antituberculosis activities. | Expenses account smallpox, including isolation hospitals. | | | | | | | | |
| | | | | | | | | \$14.50 | \$14.50 |
| | | | | | | | | 134.89 | 134.89 |
| | | | | | | | | 48.95 | 48.95 |
| | \$975.00 | | | | | | \$20,456.80 | | 23,214.75 |
| | | | | | | | | 1.35 | 25.00 |
| \$2.40 | | | | \$236.55 | | | | | 650.64 |
| 41.90 | | \$17.05 | | 290.50 | | | 18.18 | .75 | 422.83 |
| | | | | 314.70 | | | 115.40 | 294.30 | 724.40 |
| | 114.06 | | | 1.00 | | | 11.30 | 546.75 | 673.11 |
| | | | | | | | | | 20.00 |
| | | | | 95.09 | | | | 12.21 | 119.05 |
| | 84.00 | | | 223.75 | | \$93.00 | 56.00 | 4.55 | 484.60 |
| | .26 | 5.64 | | 675.24 | \$1.17 | | 243.25 | 289.71 | 1,336.31 |
| | | | | 188.23 | | | | 917.33 | 1,105.56 |
| | 10.05 | | | 12.85 | | | | | 22.90 |
| | | | | | | | 1,075.00 | | 1,075.00 |
| | 42.55 | | | 37.02 | | | | 18.60 | |
| | | | | | | | | 788.44 | 1,264.40 |
| | 844.04 | | | | | 5,826.50 | | | 6,670.54 |
| | | | | 446.31 | | | | | 446.31 |
| | | | | 85.63 | | | 44.04 | 80.92 | 210.59 |
| | 119.65 | | | 515.00 | | | | 215.10 | 854.75 |
| | | | | 16.93 | | | 20.15 | 1,721.91 | 1,742.06 |
| | | | | | | | | 95.11 | 125.54 |
| | 28.71 | | \$3.00 | 9.85 | | | | | 4.50 |
| | | | | 194.00 | | | 13.64 | 54.75 | 276.25 |
| | | | | | | | | | 194.00 |
| | | | | 838.80 | | | | | 838.80 |
| | | | | | | | | 13,408.00 | 13,594.60 |
| | | .50 | | 28.55 | 16.95 | | | | 95.50 |
| | | | | | | | | | 132.01 |
| 7.12 | | | | 181.61 | | 15.00 | | 3.10 | 329.38 |
| | | | | | | | | | 60.00 |
| 22.75 | | 368.05 | 15.75 | 4,930.18 | 925.67 | 3.25 | 90.65 | 165.25 | 7,615.96 |
| | | | | | 2,421.15 | | | | 2,421.15 |
| | 467.65 | | | | | | | | 467.65 |
| | 15.45 | | | 97.95 | | | 4.33 | 143.44 | 434.34 |
| | | | | .50 | | | | 101.33 | 101.83 |
| | | | | 105.00 | | | | | 597.00 |
| 5,000.00 | 2,164.00 | | 3,400.00 | 1,285.00 | 1,655.00 | 1,250.00 | 5,804.27 | 20,893.43 | 70,058.81 |
| | | | | | | | | 1,430.69 | 1,430.69 |
| | 96.81 | | | | | | | | 99.31 |
| | | | | | | | | 3.00 | 16.00 |
| 50.00 | 1.00 | 808.00 | | 611.90 | 660.00 | | 200.00 | 423.53 | 3,295.34 |
| 49.50 | | | | 48.55 | 145.51 | | 51.67 | 157.05 | 1,004.33 |
| | | | | 587.43 | | | | | 585.43 |
| | 138.91 | | | 5.66 | | | | 323.65 | 1,004.52 |
| | 98.50 | | | | | | | | 98.50 |
| 3,143.61 | | | 10.00 | 1,261.30 | 176.24 | | 1,073.57 | 645.84 | 11,093.14 |
| | | | | 83.03 | 93.15 | | 61.03 | 13.00 | 467.47 |
| | 2.00 | | | | | | | | 2.00 |
| 8,317.28 | 5,252.64 | 1,199.24 | 3,428.75 | 13,408.11 | 6,094.84 | 7,187.75 | 29,339.28 | 43,191.43 | 157,979.02 |

In addition there are certain provisions of law directed against noisome odors, or noxious gases, which are antiquated and need not be summarized in this report.

The licensing of embalmers.—The State board of health has promulgated regulations relating to burials, disinterments, and the transportation of dead bodies. In order to ship a body it must be embalmed. This can be done only by an undertaker licensed by the State board of health. This license is granted after the undertaker has passed an examination before a board composed of the State health officer, one of the assistants to the State health officer, and the chief bacteriologist of the State board of health. The examination is held in the presence of a representative of the Florida State Funeral Directors' and Embalmers' Association.

The regulations promulgated on the subject are similar to those in other States and will not be summarized here.

RECEIPTS AND EXPENDITURES.

The State board of health of Florida is supported by a tax levy of one-half mill, which gave it an income in 1915 of \$142,930, and which will amount in 1916 to approximately \$146,285. During the year 1915 there was spent in the support of the health organization the sum of \$157,979.02. It therefore required the entire income for the year plus a large part of the balance remaining from the previous year, to defray the necessary expenses. The amount which the State board of health receives through the tax levy appears to be a generous income until it is understood that out of it must be paid certain expenses which are ordinarily not incurred by a State health department, but which are usually paid for out of funds at the disposal of other State or local authorities. In Florida, however, the payment of such expenses has been imposed upon the State board of health by the legislature. These unusual expenses are as follows:

| | |
|---|--------------|
| Veterinary division of the State board of health..... | \$29, 339.28 |
| Maintenance of isolation hospitals and reimbursement for smallpox cases.. | 4, 277.64 |
| Reimbursement for birth and death certificates..... | 2, 421.15 |
| Treatment of crippled children..... | 7, 187.75 |
| Total..... | 43, 225.82 |

If this amount be deducted from the yearly expenditures, there is left \$114,753.20, which figure represents more closely the cost of health activities in Florida as compared to those of other States.

The expenditures of the State board of health have never exceeded the funds at its disposal. There has been, in fact, at the end of each year, a balance available for the payment of expenses incurred during the coming year. This balance, however, is fast becoming less and less with the increasing activities of the health organization. It is

true that the size of the State board of health fund increases annually, but its growth is slow and does not keep pace with the rapid expansion of a modern health department in a State of the importance of Florida. The time has therefore arrived when the State board of health feels that it must leave undone certain necessary things in fear that the balance sheet may show a deficit.

While there is no desire to minimize the importance of the work carried on by the veterinary division it is obvious that it bears little relation to the conservation of the public health. It is to a large extent an economic measure. During the year it cost to maintain this division \$29,339.28, a little less than one-fifth of the amount required to support the entire health organization. For hog-cholera serum and vaccine alone there was expended \$20,456.80, and hog cholera is a malady which in no way jeopardizes the health of man. The latter remark might be made as well for Texas fever, a disease not transmitted to man.

Admitting the necessity for the prevention of disease among the lower animals and its value to the farmers of the State, the fact is nevertheless deplored that work of this nature must be paid for out of funds intended for the maintenance of the health of human beings. A special appropriation of \$30,000 from the legislature for the prevention of disease among the lower animals would make available to the health department money that could well be spent for strictly legitimate public health purposes.

This expedient would permit the State board of health to enlarge the scope of its present work and take on increased activities until the time arrives when the State health fund has reached that size which will provide an adequate amount to defray all expenses.

In lieu of a special appropriation to support the veterinary division, it is suggested that taxable property might be assessed at a figure more nearly approaching its actual value.

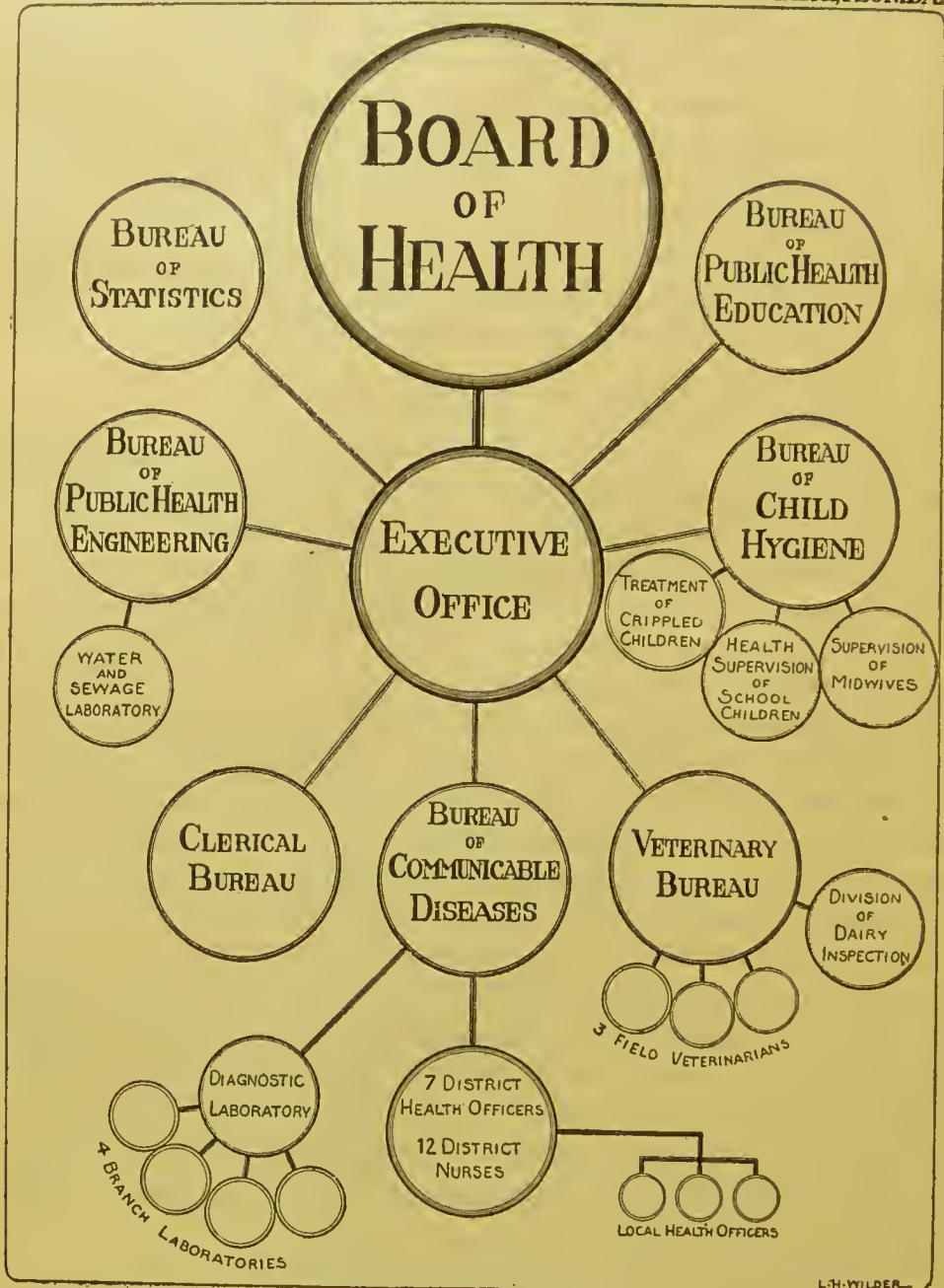
It must be emphatically pointed out that the counties are at present spending little or nothing in the interest of public health, notwithstanding that they are under the obligation to assume a share of the expense incurred in combating disease. They should be required to take over and maintain the isolation hospitals and assume the expense of caring for patients suffering with communicable diseases, smallpox included.

The accompanying table shows the expenditures of the health department during the year 1915 by activities and items of expenditure.

RECOMMENDATIONS.

As a result of the foregoing study it may be concluded that the State board of health is now engaged in many important activities, but that certain changes are desirable in order to increase efficiency

SCHEME OF REORGANIZATION SUGGESTED FOR THE STATE BOARD OF HEALTH, FLORIDA.



U.S. PUBLIC HEALTH SERVICE.

and to secure quicker and more certain results. To assist in bringing this about the following recommendations are made:

1. That the designation of the State board of health be changed to the State department of health.

2. That the State department of health be divided into the board of health, the executive office, a bureau of communicable diseases, a bureau of public health engineering, a bureau of public health education, a bureau of statistics, a bureau of child hygiene, a clerical bureau, and a veterinary bureau.

3. That the board of health consist of seven members to hold office for five years and to be so appointed that there will be but one change each year.

4. That a full time chief be placed in charge of each of the bureaus.

5. That the chief of the bureau of communicable diseases be responsible for the work of district and local health officers and public health nurses, the collection of morbidity reports, the administration of the laboratories, and in general the activities concerned with the control of preventable diseases.

6. That the chief of the bureau of public health engineering be granted advisory and supervisory control over the domestic water supplies, drainage, the disposal of sewage, and garbage and trades wastes within the State, and that there be established in this bureau a water and sewage laboratory.

7. That the chief of the bureau of public health education be made responsible for all of the educational activities of the department, including publications, exhibits, and lectures.

8. That the chief of the bureau of statistics be made responsible for the registration of births, deaths, and marriages, and the statistical compilation and tabulation of all data for the department.

9. That the chief of the bureau of child hygiene be made responsible for the activities concerned in child welfare, including pre and postnatal nursing, the health supervision of schools, the supervision of midwives, and the treatment of crippled children.

10. That the chief clerk be designated as chief of the clerical bureau to have control of the clerical force of the department and supervision over the records, property, and accounts.

11. That the activities of the veterinary bureau be the same as they are now with the addition of the inspection of dairy farms.

12. That the assistant to the State health officer who is not at present in charge of a district, but employed in the State at large, be placed in the west central district, vice the bacteriologist resigned, and that there be employed a bacteriologist who need not be a physician, for work in the branch laboratory located in that district.

13. That the district health officer be made responsible for the enforcement of all public health laws and the carrying on of the field activities of the State board of health within his district and that for

purposes of administration he be given supervision over the public health nurses and the branch laboratory located in his district.

14. That in order to make the work of the health department more effective the district health officers be required to be more active in the field and to carry on more thorough and intensive studies relative to the conditions of their districts and the diseases existing therein.

15. That district health officers be prohibited from engaging in the practice of medicine or any other business that will interfere with their official duties.

16. That the nursing force be added to from time to time as funds will permit so that eventually the number will be such that each may have a small district and be enabled to carry on all of the duties required of a public health nurse.

17. That the district health officers and public health nurses before they receive an appointment be required to pass a competitive examination.

18. That both medical officers and nurses be given a six months' probationary appointment in order to determine their adaptability for the work required.

19. That the district health officers at their first appointment receive a salary of \$1,600 a year with a regular increase at stated intervals at the discretion of the State board of health.

20. That the public health nurse be started on a salary of \$75 a month with a regular increase at stated intervals at the discretion of the State board of health, and that she be given a course of instruction before entering upon her duties.

21. That the position of the county agent be abolished and the county included in that district to which it logically belongs.

22. That every effort be made to procure adequate health departments in those larger cities where they have not already been provided for, and that in cities with a population of 5,000 or less health inspectors trained in sanitary science be employed to give full time to their duties and work under the supervision of the district health officer.

23. That the State board of health provide the means to give training and instruction to those men who are to be appointed in the above capacity.

24. That there be called annually by the State health officer a conference of district and local health officers and bacteriologists to consider public health matters in the State of Florida.

25. That, in accordance with the vital statistics act, there be promulgated regulations providing for the reporting of sickness that the prevalence of disease may be known and that these regulations con-

form to the model law proposed by the United States Public Health Service.

26. That the act providing for the registration of births and deaths be put into effect without delay.

27. That a comprehensive law be enacted making it compulsory on the part of all persons interested to have plans for proposed installations of water supplies, sewage, and refuse disposal systems, approved by the State department of health. That the State department of health be empowered to require any changes or extensions in already existing installations that may be necessary to insure safe water supplies or proper sewage or refuse disposal systems; or to order the installation of water-supply and sewage or refuse disposal systems in the absence of same. That the State department of health have the power to close, or to prevent the use of water from, any well, spring, or other source that in its opinion is dangerous to health, or to require the filling or draining of places where there is any accumulation of water, breeding of mosquitoes, or other condition dangerous to health.

28. That the law providing for the medical inspection of school children be amended as suggested in the body of this report.

29. That certain of the antiquated laws relating to the public health be amended or repealed.

30. That more comprehensive regulations be promulgated by the State board of health for the purpose of controlling the preventable diseases.

31. That the officials of the State department of health be full-time men with the exception of the assistant in charge of the treatment of crippled children, the live-stock agents, and the members of the State board of health, as already provided for.

32. That the methods of keeping accounts be changed so as to allow an accurate determination of the actual cost of any bureau or division or any special work at any time.

33. That the isolation hospitals at present being maintained by the State board of health be transferred to the counties and that the law requiring the State board of health to pay for the care of patients suffering with smallpox, yellow fever, and cholera be repealed.

34. That there be an appropriation by the State legislature in the sum of \$30,000 to support the veterinary bureau of the State board of health, and that this amount be reappropriated until such time as the State health fund has reached a size that will enable the State department of health to carry on all of its activities adequately without the assistance of a special appropriation from the legislature.

35. That the field staff be furnished with automobile transportation as soon as the funds of the department will permit.

36. That a popular bulletin on preventive medicine to be used especially for instructing the children in the public schools be issued monthly or oftener by the State department of health.

37. That a sanitary code be written by the health department for adoption by the various municipalities not already provided with adequate ordinances for the maintenance of the public health and that this code be promulgated as regulations of the State board of health.



PRESENTED BY
PROF. G. H. F. NUTTALL

UNITED STATES PUBLIC HEALTH SERVICE
RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION IN NEBRASKA

BY

CARROLL FOX

Surgeon, United States Public Health Service

REPRINT No. 348

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PUBLIC HEALTH ADMINISTRATION IN NEBRASKA.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of public health organization and administration in the State of Nebraska, carried on through a period of approximately six weeks from March 15, 1916, to May 1, 1916.

Nebraska has an area of 76,808 square miles, contains 93 counties, and had a population on July 1, 1915, estimated at 1,258,624. There are but two large cities in the State—Omaha, with an estimated population of 163,200, and Lincoln, with an estimated population of 46,028. The eastern part of the State is by far the most populous. The principal industries are grain and cattle raising, and to a lesser extent dairying. Manufacturing is of minor importance.

During the course of the study the following places were visited: Omaha, Lincoln, Grand Island, Hastings, North Platte, Kearney, Seward, Columbus, and Ashland.

For information and assistance obtained during the study the writer is indebted to the various State and local officials and others interested in the subject of the public health.

THE STATE BOARD OF HEALTH.

Composition of the board.—The State board of health is composed of the governor, the attorney general, and the superintendent of public instruction. The governor is ex officio chairman and the superintendent of public instruction is secretary of the board.

Meetings.—The board meets upon the call of the chairman. A majority constitutes a quorum.

Powers and duties of the board.—The powers and duties of the board of health are as follows:

¹ Reprint from the Public Health Reports, vol. 31, No. 27, July 7, 1916, pp. 1750-1775.

To have supervision and control over all matters relating to sanitation and all quarantine necessary to prevent the spread of communicable diseases.

To formulate, adopt, and publish reasonable rules and regulations to promote sanitation throughout the State and prevent the introduction or the spread of disease.

To adopt and enforce special quarantine and sanitary regulations in emergencies, or when the local board of health fails or refuses to act, or where no board has been established. Under such circumstances, the necessary expenses must be defrayed by the locality.

To make careful inquiry into the causes of the various communicable diseases, epidemic and endemic, and to take prompt action to suppress them.

To make careful studies relative to the sanitary condition of localities, employments, the personal and business habits of the people, and the relation of the diseases of the lower animals to man, and to promulgate the necessary regulations to protect the people against the diseases of lower animals.

To collect and preserve such information as may be useful in the discharge of its duties and for dissemination among the people.

In addition to the above the board of health is empowered to license and inspect maternity homes, to grant certificates to practice medicine; to inspect the equipment and methods of teaching in all medical colleges and schools within the State and to refuse to examine graduates of any school which it may judge not up to standing; and to grant licenses to practice dentistry after the applicants have been examined by a board of examiners composed of dentists appointed by the board of health. The State board of health is also required to appoint a board of examiners for embalmers.

It is the duty of all local, municipal, and county boards of health, health authorities, officers of State institutions, police officers, sheriffs, constables, and all other officers and employees of the State or of any locality, and every person, to observe and enforce the regulations promulgated by the State board of health. For violation there is provided a fine of not less than \$5 nor more than \$200.

The State medical board.—Inasmuch as the State board of health consists of State officers not necessarily versed in sanitary matters, there is authority in law for the appointment of a State medical board made up of four physicians, each having had at least seven years' consecutive practice within the State. Two of these physicians must be appointed from the so-called regular school, one from the so-called homeopathic, and one from the so-called eclectic school.

They receive their appointment from the governor and are entitled to reimbursement from the fees collected from applicants for license to practice medicine.

Duties of the secretaries or members of the State medical board.—It is the duty of the secretaries to assist and advise the board of health, to summon witnesses, and to take testimony and report such testimony, together with advice and recommendations, to the board of health. It is also their duty to hold examinations for license to practice medicine under rules and regulations prescribed by the board of health.

Finally, they are required by law to advise, assist, and act under the direction of the board of health in the performance of such duties as relate to communicable disease.

Discussion.—Under the constitution of the State of Nebraska, all State boards must be composed of elective officers of the State. The State board of health is, therefore, a lay board comprised of State officials who lay no claim to any special knowledge on the subject of public health. For this reason the idea was conceived to create a board composed of physicians who could act as advisors to the State board of health. It seems, however, that it was not thought necessary to provide for a State health officer with special qualifications to act as executive officer of the board of health. In the absence of such a position, the advisory State medical board, whose members are known under the law as secretaries, has assumed the details of administration. Because of its professional character, and therefore greater knowledge on public health matters, it has to a certain extent assumed the duties of the board of health, and thus at present the executive of the State board of health is in reality a board of four officials. This is a cumbersome arrangement and results in a subdivision of authority and responsibility not conducive to efficiency.

The system of a board within a board is not in accordance with modern ideas. Furthermore, the members of the advisory board live in different parts of the State and meet at infrequent intervals. Their secretary, to whom they have delegated the authority to represent them in official matters, does not live in Lincoln and, therefore, can not keep in close touch with the subordinates of the board of health who are carrying on the active work.

Many misunderstandings and deficiencies occurring in the health organization can be traced to the absence of an executive head. In order to increase efficiency and bring the State board of health on a plane with similar organizations elsewhere, it is necessary, there-

fore, to provide for a full-time State health officer to act as executive officer of the board of health. Such a man should have had previous experience in public health work; he should have administrative ability; and he should retain his position as long as he rendered efficient service to the State. In this way all responsibility would be assumed by one experienced individual. It is suggested that an examination for State health officer be held before the secretaries and the board of health, the applicant securing the highest mark to be appointed to the position by the State board of health.

At the same time certain divisions in the health department should be organized to carry on special duties, each division to have a full-time chief to act as the immediate assistant to the State health officer. As the latter would be required to assume the responsibilities of administration and enforcement of laws and regulations, his assistants should be appointed by the State board of health upon his recommendation. These bureau chiefs should hold office during efficiency and not be discharged on account of political considerations.

The State medical board should be retained as the medical examining board. It should also act in a purely advisory capacity when called upon for advice by the board of health or the State health officer.

To bring this reorganization about and render it effective, certain of the laws would have to be amended and more money appropriated.

REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths is required by a law patterned very closely after the model law proposed by the Bureau of the Census. Its enforcement has been imposed on the State board of health, and two clerks, at \$840 per annum each, are engaged in the work.

Death registrations.—During 1915, 10,572 deaths were reported to the State registrar. As the population of the State of Nebraska is estimated at 1,258,624, the recorded death rate is 8.4 per thousand. This is, without doubt, too low. In order to arrive at a figure more closely approaching the true death rate, figures for 10 of the principal cities of Nebraska have been computed for the calendar year 1915, and an average calculated which may be looked upon as the approximate urban death rate for the State as a whole. The results given in the following table show an average death rate of 12.1. It is believed to be not unfair to assume that the death rate for the State as a whole is probably at least 12 per thousand.

| City. | Population estimated as of July 1, 1915. | Number of deaths. | Death rate per 1,000 inhabit- ants. | Number of births. | Birth rate per 1,000 inhabit- ants. | Number of still- births. |
|-------------------|---|----------------------|---|----------------------|---|--------------------------------|
| Omaha..... | 163,200 | 1,828 | 11.2 | 2,864 | 17.5 | 139 |
| Lincoln..... | 46,028 | 610 | 13.2 | 1,169 | 25.3 | 41 |
| Grand Island..... | 12,519 | 191 | 15.2 | 244 | 19.4 | 7 |
| Hastings..... | 10,873 | 158 | 14.5 | 334 | 30.7 | 6 |
| Beatrice..... | 10,137 | 142 | 14.0 | 127 | 12.5 | 5 |
| Fremont..... | 9,770 | 112 | 11.4 | 185 | 18.9 | 4 |
| Norfolk..... | 7,096 | 89 | 12.5 | 130 | 18.3 | 2 |
| York..... | 6,786 | 67 | 9.8 | 92 | 13.5 | 2 |
| Kearney..... | 6,486 | 126 | 19.4 | 191 | 29.4 | 3 |
| Columbus..... | 5,760 | 75 | 13.0 | 136 | 23.6 | 4 |
| Total..... | 278,655 | 3,398 | 12.1 | 5,472 | 19.6 | 213 |

Deaths in State institutions and stillbirths have been excluded in the calculation.

Preventable deaths.—Of the 10,572 deaths, 5,056 or 47.8 per cent, were due to causes that might have been prevented. The number of deaths from these diseases, together with the death rate per 100,000 population, is shown in the following table:

Total preventable deaths in entire State, calendar year 1915.

| Recorded cause of death. | Number of deaths. | Death rate per 100,000. |
|--|----------------------|-------------------------------|
| Pneumonia..... | 962 | 76.6 |
| Tuberculosis, pulmonary..... | 481 | 38.3 |
| Tuberculosis, other forms..... | 59 | 4.7 |
| Influenza..... | 202 | 16.0 |
| Typhoid fever..... | 109 | 8.6 |
| Measles..... | 106 | 8.4 |
| Diphtheria..... | 91 | 7.2 |
| Whooping cough..... | 87 | 6.9 |
| Scarlet fever..... | 54 | 4.3 |
| Tetanus..... | 17 | 1.3 |
| Septicemia (puerperal included)..... | 106 | 8.4 |
| Meningitis (tuberculous excluded)..... | 67 | 5.3 |
| Erysipelas..... | 30 | 2.3 |
| Diarrheas and enteritis..... | 258 | 20.5 |
| Bronchitis..... | 71 | 5.6 |
| Other infections..... | 97 | 7.7 |
| Malignant growths..... | 698 | 55.6 |
| Accident..... | 472 | 37.6 |
| Lead poisoning..... | 1 | ..... |
| Pellagra..... | 1 | ..... |
| Rickets..... | 5 | ..... |
| Causes peculiar to early infancy..... | 1,082 | 86.2 |
| Total..... | 5,056 | ..... |

Deaths of infants under 1 year of age for year 1915.

| Recorded cause of death. | Number of deaths. | Per cent of total deaths under 1 year. |
|--|-------------------|--|
| Pneumonia..... | 246 | 14.7 |
| Diarrhea and enteritis..... | 137 | 8.2 |
| Whooping cough..... | 59 | 3.5 |
| Measles..... | 30 | 1.7 |
| Influenza..... | 24 | 1.4 |
| Meningitis (tuberculous excluded)..... | 20 | 1.1 |
| Erysipelas..... | 8 | ..... |
| Tetanus..... | 3 | ..... |
| Scarlet fever..... | 1 | ..... |
| Tuberculosis..... | 6 | ..... |
| Poliomyelitis (infantile paralysis)..... | 3 | ..... |
| Cerebrospinal meningitis..... | 1 | ..... |
| Syphilis..... | 5 | ..... |
| Other infections..... | 33 | 1.9 |
| Premature birth..... | 365 | 21.8 |
| Congenital debility..... | 154 | 9.2 |
| Convulsions..... | 42 | 2.5 |
| Other causes, mostly preventable..... | 469 | 28.1 |
| Unknown..... | 63 | ..... |
| Total..... | 1,669 | ..... |

Infant mortality.—Of the total deaths, 1,669 occurred in infants under 1 year of age. Practically all of these deaths might have been prevented. This figure represents 33 per cent of the total preventable deaths. The recorded infant mortality rate for the State during 1915 was 64.2.

Birth registration.—The total number of births registered in the State during 1915 was 25,963, giving a recorded birth rate of 20.6 per thousand.¹

Discussion.—In order to bring the State up to the standard required by the United States Census Bureau, some intensive work is required. The increased activities would be necessitated both in the office and in the field and would require an additional force, including a full-time statistician who could devote part of his time to investigations of the efficiency of registration in different localities, and an additional clerk, thereby permitting a more careful check on reports received, as well as a more extensive statistical study of material on hand.

When a locality is visited, reports of births and deaths in local newspapers and church and cemetery records should be consulted. The names of persons, obtained in this way, should be compared with the certificates received in the health department. Consultations should be had with local officials, physicians, and other citizens, deficiencies determined, and these persons encouraged by instruction and explanation to take a personal interest in securing more efficient birth and death returns.

¹ In making all of the above computations stillbirths have been excluded.

In order to increase the registration of both births and deaths, it is suggested that the cooperation of the ministers should be obtained, so that they might use their influence with the parents in having a birth or death certificate submitted where it had not already been done, whenever officiating at a christening or a funeral.

In remote parts of the State it likewise might be well to make those undertakers who have the confidence of the health department subregistrars, giving them the authority under certain conditions to issue burial permits, afterwards reporting to the nearest local registrar.

It might likewise be well to require all persons or firms dealing in coffins to report a sale to the State board of health, giving the name of the deceased.

There is a plan in use in certain other States which it might be well to adopt in Nebraska, when the office force is large enough to perform any increased work. This consists in issuing to the parents a receipt for every birth certificate received, thus giving them a record which they can preserve and which will encourage them to make sure that a birth report has been forwarded by the proper person.

EPIDEMIOLOGICAL ACTIVITIES.

The epidemiological activities of the State board of health are carried on by the State health inspector, who has also been made responsible for the efficiency of the birth and death registrations and, to a certain extent, the activities concerned with the maintenance of the purity of water supplies and the disposal of sewage within the State. This official is appointed by the board of health from three applicants nominated in writing by not less than three members of the State medical board. He must be a graduate physician of skill and experience. His term of office is one year, and he is subject to removal for cause after a hearing before the State board of health. He receives a salary of \$1,800 per year.

Report of Diseases.

Requirements of law.—The following is a summary of the law requiring the notification of diseases:

It is the duty of all boards of health and of all physicians in localities where there are no health authorities, or where such health authorities fail to act, to report to the State board of health promptly the existence of Asiatic cholera, yellow fever, smallpox, scarlet fever, diphtheria, typhus fever, typhoid fever, and such other communicable diseases as the State board of health may from time to time specify.

For violation there is provided a fine of not less than \$10 nor more than \$100 for each offense.

Requirements of regulations.—The following diseases are declared notifiable:

| | |
|---------------------------|----------------------------------|
| Anthrax. | Whooping cough. |
| Chicken-pox. | Dysentery, amebic and bacillary. |
| German measles (rötheln). | Cholera, Asiatic. |
| Glanders. | Diphtheria (membranous croup). |
| Measles. | Epidemic sore throat. |
| Mumps. | Polomyelitis. |
| Ophthalmia neonatorum. | Scarlet fever (scarlatina). |
| Puerperal septicemia. | Smallpox. |
| Rabies. | Bubonic plague. |
| Trachoma. | Cerebrospinal meningitis. |
| Tuberculosis. | Typhus fever. |
| Typhoid fever. | |

It is the duty of every physician attending a person supposed to be suffering from any of the above-named diseases to report in writing within 24 hours the name and residence to the local health officer.

Where a physician is not in attendance, it becomes the duty of the owner or agent of the building in which the patient resides or the head of the family in which the disease occurs to report as above.

It is also the duty of all superintendents or other persons in charge of hospitals, institutions, or dispensaries, of school-teachers, of proprietors of hotels, boarding and lodging houses, of nurses or persons in charge of camps to report the presence or the supposed presence of any communicable disease to the local health officer.

It is likewise the duty of physicians or persons in charge of milk-producing farms or creameries to report immediately to the local health officers the presence of any case of cholera, diphtheria, amebic and bacillary dysentery, epidemic cerebrospinal meningitis, septic sore throat, measles, scarlet fever, smallpox, or typhoid fever occurring in the establishment; and the health officer is required to report immediately to the secretary of the State board of health by telephone or telegraph the existence of such disease, together with all facts relative to the isolation of the case, and to give the names of persons and the locality to which such dairy products are delivered.

Physicians or others are required to report the occurrence of a number or group of cases of food poisoning to the State board of health and to the local health officer. The local health officer is also required to report as above to the State board of health.

Discussion.—The reports of cases of communicable diseases occurring during 1915, as filed in the health department, are grossly deficient. Heretofore physicians in the State have been required to report their notifiable diseases directly to the State board of health. Recent regulations, however, require that these reports be made to the local health officer, who in turn must transmit a quarterly summary of these reports to the State board of health. This means that reports received will be too old to be of any value, except for purely statistical purposes. It would be better to have the local health officer transmit the original morbidity reports as soon as he has obtained all of the information from them that he may need for immediate action.

It is true that physicians and others are required to report an outbreak of disease immediately, but in order that the health department may carry on efficient work, it should be cognizant of the first case, so that prompt prophylactic measures may be taken and an epidemic prevented.

It should be needless to say that a prompt report must be made by physicians of all cases of notifiable diseases. This is an obligation which the practicing physicians owe to their community, but one which many of them do not seem to realize.

The Control of Diseases.

Requirements of the law.—The laws relating to the power of the State board of health to promulgate regulations for the purpose of controlling the communicable diseases have already been mentioned.

In addition to these laws there is one which authorizes the State board of health to prohibit the use of the common drinking cup in public places, vehicles of common carriers, etc., and provides a fine of not to exceed \$25 for the violation of such regulations.

Requirements of regulations.—These regulations are comprehensive, yet notably deficient in that no mention is made of the necessity for vaccination in the case of smallpox.

They cover the subjects of the exclusion from school and public gatherings of persons suffering from certain diseases; the exclusion from school and public gatherings of well members of the family; the responsibility of parents and guardians under such circumstances; quarantine; the precautions to be taken by physicians; terminal disinfection; the submission of cultures from cases of diphtheria; the exemption of adult members of the family from quarantine; the removal of cases of communicable diseases; the removal of infected articles; the right of entry and inspection; the care of the discharges; special precautions; placarding and interference with placards; maximum periods of incubation; minimum periods of isolation; the sale, distribution, or handling of foods; cleansing, renovation and disinfection of rooms and articles; disinfection of the person; forbidding the renting of rooms while contaminated with infected material; duties of common carrier; the placarding of common carriers; the duties of undertakers; forbidding public funerals in certain diseases, and the sanitary maintenance of camps.

In addition, there are some special regulations promulgated for the purpose of preventing the spread of tuberculosis. These provide for the reporting of tuberculosis to the local health officer, who is required to transmit to the attending physician a printed statement specifying the precautions that must be taken to prevent the spread of the disease. After the attending physician has taken all these precautions he is entitled to a fee of \$1, to be paid by the locality.

It is required that registrars report promptly to the health officer the name and address of every person reported to have died of tuberculosis. If it is found that no report of the case has been made, his attention must be called to the provisions of the regulations; after repeated violations, local authorities are required to take the necessary steps to enforce the penalty provided. The

regulations also provide for the examination of sputum, the protection of records and the disinfection of premises, prohibit the occupancy of any apartment or premises until the disinfection has been accomplished, and provide a penalty of not to exceed \$10 in case a person is careless or refuses to comply with the precautions necessary to prevent the spread of the disease. Where physicians fail to perform the duties required by the regulations, or make false reports, they may be subjected to a fine of not to exceed \$100. Physicians are also required to report the recovery of a case to the local health officer. In addition to the penalty already mentioned, there is another providing a fine of not less than \$5 nor more than \$50 for violation of certain of the provisions.

The tuberculosis sanatorium.—The State maintains an institution for the care of the tuberculous. Both advanced and incipient cases are taken. At present its maximum capacity is approximately 40 patients, who are housed in a well-designed wooden pavilion, containing two wards, one for male and one for female patients. There will soon be ready for occupancy a brick building, which will increase the capacity of the sanatorium to approximately 100 patients. There is likewise under construction a power plant to furnish heat and light.

There is also a small tuberculosis pavilion in connection with the county hospital of Douglas County. It is too small for the purpose.

It is needless to state that the facilities for isolating cases of tuberculosis within the State are entirely inadequate and it is suggested that steps be taken to interest the different counties in building sanatoria in which to place tuberculous patients who are a menace to the health of the community.

Discussion.—To a large extent the duties of the State health inspector are concerned with the settlement of disputes among physicians over diagnoses and of disagreements among the local officials as to how certain diseases should be handled under the regulations. The amount allowed by the legislature for traveling expenses incurred by officials of the State board of health is entirely inadequate and would not permit of any intensive work being carried on for the control of disease. Nor could one man properly perform the comprehensive duties of the office even though the fund for traveling expenses were sufficiently large to enable him to be on the road at all times. Furthermore, one man could not be expected to be an expert on the three important subjects of epidemiology, sanitary engineering, and vital statistics.

On account of the inadequate force in the board of health and lack of funds, the enforcement of regulations must necessarily be left to the local health officers. Except in a few instances, however, local health organizations are very deficient. In order to get results, it is necessary, not only to reorganize and enlarge the State board of health, but to require that each county and city be provided with a

health organization which could render active assistance to the State officials. A study of the table already given will show that much active and intensive work is necessary in the interest of the public health. This table represents but approximately 70 per cent of the deaths that actually occur from preventable causes. If one could add the unreported deaths as well as those due to syphilis and other communicable diseases reported under other heads, the number of deaths from preventable causes would be shown to be much greater. The greatest number of deaths of this nature were due to pneumonia, a disease quite common in Nebraska, especially among the very old and the very young. Next in the number of deaths is malignant growths, followed by tuberculosis. Influenza, or a disease resembling it and reported under that name, occasioned 202 deaths, many of them in the aged and complicated by pneumonia. Smallpox is all too common, due to the fact that general vaccination is not practiced. The ordinary communicable diseases, as for instance scarlet fever and diphtheria, are quite prevalent.

Occupational diseases play a very minor part in the public health problems of the State.

Diagnostic Laboratory.

The bacteriological laboratory of the State board of health was established in 1913. Previous to that time the necessary work had been performed in the laboratory of the State University at Lincoln.

In the laboratory there is employed one bacteriologist, at a salary of \$2,400 per year; he has no assistant. Much of his time is taken up with the examination of water supplies. In addition to this examinations are made of cultures in the case of diphtheria both for diagnosis and for release from quarantine; of sputum for the diagnosis of tuberculosis; of blood for the Widal test in case of suspected typhoid; and of animal heads for suspected rabies. Some clinical laboratory work is carried on, as for instance the examination of urine and gastric contents, and examinations for both the food and drug commissioner and the State veterinarian.

Method of procedure.—Approved mailing outfits are supplied to physicians and health officers upon request. Those in use for the diagnosis of diphtheria contain a tube of blood serum, a wooden tongue depressor, and two swabs. Those for the diagnosis of tuberculosis contain a stoppered wide-mouth bottle with a small quantity of carbolic-acid solution. Wright's capsules are furnished for the submission of blood specimens for the Widal reaction; but, as is so often the case, physicians do not seem to understand their use, and finally resort to the drop of blood on a glass slide in order to secure a specimen suitable for examination. Two outfits are furnished for

forwarding water samples to the laboratory, one to be used when chemical analysis is desired and one for bacteriological examination.

The laboratory is well equipped, and examinations are made in a scientific manner.

Discussion.—A study of the following table will show that physicians are taking but little advantage of the laboratory facilities offered by the State. On the other hand, it should be said that there is as much work carried on in the laboratory as may reasonably be expected from one man. Previous to April, 1915, the bacteriologist had an assistant who received \$1,000 per year and who relieved him of much of the routine work, as, for instance, the cleansing and sterilization of glassware, preparation of media, etc.; but the position has since been abolished. It is not economy to use the time of a skilled employee to perform duties that could as well be done by a less skilled and lower paid man. Such an arrangement also interferes with the scientific work which the bacteriologist should be required to do.

If the State is to take its place in the front rank in public health matters, it is necessary that the amount of work performed in the laboratory be greatly increased and its scope broadened. Physicians should be encouraged to send in more specimens, and facilities should be extended to physicians and health officers so that they could have Wasserman reactions determined, as well as the examination of tissues or tumors for suspected malignancy.

Mailing outfits for the submission of specimens for examination should be supplied to conveniently located distributing stations in different parts of the State, so that physicians could secure them without delay.

There should be employed not only a bacteriologist to perform the diagnostic work but a chemist to take over the examination of water and sewage analysis and a laboratory attendant to perform that part of the routine work required preparatory to making investigations.

It should not be necessary for either the bacteriologist or the chemist to carry on correspondence, which in a properly organized health department would be attended to by the sanitary engineer and the epidemiologist.

The forms for reporting the results of diagnoses should be of the same size as the morbidity report cards, so that positive reports of diagnosis could be filed with the epidemiologist in lieu of morbidity reports.

Daily reports should be made to the epidemiologist, giving the location from which positive specimens were received.

It is suggested that too much stress is laid on the importance of the chemical analysis of water, which, moreover, takes a great deal

of time. The most important point to determine is the presence or absence of colon bacilli. Because of local conditions, it may be necessary for the present to continue chemical analysis of water, but with the proper organization and the formation of a bureau of public health engineering, such examinations need only be made when considered necessary by the sanitary engineer after a sanitary survey.

The cost of maintaining the diagnostic laboratory during 1915 was \$2,975.46, making a cost per examination of \$1.36. It may be safely assumed that the purely diagnostic work of the laboratory should be increased at least tenfold. Excluding water analysis, the work would then amount to 13,790 examinations, with an increase of only \$1,340, \$840 of which would be spent for a laboratory assistant and \$500 for maintenance. This would reduce the cost per examination to 31 $\frac{1}{3}$ cents.

Tabulation of examinations made in the laboratory of the State board of health, calendar year 1915.

| | Positive. | Negative. | Total examinations. | Unsuitable for examination. |
|------------------------------------|-----------|-----------|---------------------|-----------------------------|
| Water: | | | | |
| Chemical..... | | | 144 | |
| Bacteriological..... | | | 480 | |
| Ice: | | | | |
| Chemical..... | | | 88 | |
| Bacteriological..... | | | 88 | |
| Milk (human), bacteriological..... | | | 2 | |
| Cerebrospinal fluid..... | | | 13 | |
| Milk (cows), bacteriological..... | | | 127 | |
| Milk (human), chemical..... | | | 40 | |
| Widal reactions..... | 78 | 153 | 231 | 22 |
| Diazo reactions..... | 46 | 23 | 69 | |
| Rabies..... | 5 | 32 | 37 | |
| Diphtheria, cultures..... | 02 | 169 | 231 | 27 |
| Tuberculosis, sputum..... | 103 | 225 | 328 | 2 |
| Malaria..... | 2 | 6 | 8 | |
| Vaccines: | | | | |
| Antityphoid..... | | | 46 | |
| Autogenous..... | | | 1 | |
| Miscellaneous..... | | | 232 | |
| Feces..... | | | 14 | |
| Total..... | | | 2,179 | 51 |

Local Health Authorities.

Requirements of laws.—In municipal corporations the law provides for the creation of a board of health to consist of the mayor, the city physician, the president of the city council, and the marshal. This board is authorized: To make and enforce necessary regulations relating to matters of health and sanitation, including the control of communicable diseases, control of hospitals, sanitation of streets, vacant grounds, stockyards and the like, and wells, cisterns, privies, cesspools, stables, and other places that may become offensive; to abate or prevent the occurrence of nuisances; and to enforce all State laws relating to health and sanitation. The jurisdiction of the board of health ex-

tends 5 miles beyond the city limits. Penalties are provided for the violation of such regulations.

The board of trustees of villages is authorized by law to appoint a board of health to consist of three members, one of whom shall be a competent physician. This board is authorized to enforce the quarantine laws in the village and to have jurisdiction 3 miles beyond the village limits. Where a board of health is not created, the board of trustees is vested with the powers and duties of a board of health and is required to enforce the regulations of the State board of health. The members of the board of health hold office for one year, unless sooner removed by the president of the board.

County boards are required to establish a board of health, one member of which shall be a legally registered physician. Such boards have jurisdiction throughout the county except in incorporated cities and villages having the power to establish boards of health and quarantine regulations. The board is required to make and enforce regulations to prevent the introduction and spread of communicable diseases. Where no board has been established, it is the duty of the county board of supervisors, or commissioners, to enforce the quarantine laws and regulations of the State board of health.

Requirements of regulations.—Local health officers are required to make quarterly reports as to general sanitary conditions and the presence of disease. They are also required to keep in close touch with the diseases existing within their jurisdiction and, if necessary, to notify the State board of health of conditions. They shall report to the State board of health any deficiency in birth and death registrations occurring within their respective districts, or any violation of the vital statistics act. They are required to investigate water supplies, sewerage systems, public buildings, and conditions of places where nuisances are liable to arise, and to make report from time to time to the State board of health upon the results of such investigation. All conditions needing an investigation must be immediately reported by them to the State board of health. They must obey such directions as may be given them by the State board of health. At least once every year, or as often as is deemed necessary, local health officers are required to meet when called by the State board of health for conference on public health matters.

The only cities having health departments worthy of the name are Omaha and Lincoln. Their organizations are described as follows:

Omaha.—The city of Omaha is under a commission form of government. One of the commissioners is known as the commissioner of police sanitation and public welfare. The department of health is under the control of a health commissioner, who is directly responsible to the commissioner of police sanitation and public welfare. The commissioner of health receives \$3,000 per annum and is permitted to do outside practice.

The medical work required for the control of communicable diseases is performed by the commissioner and two medical assistants who are part-time men; one receives \$125 and one \$100 per month. The methods practiced in the control of these diseases are based on modern ideas. The city is fortunate in having an isolation hospital for the common communicable diseases, as well as one for the isolation of smallpox. At one time the former was a large residence,

which has been remodeled to suit the purposes and is conveniently located near the business section of the city. It will, if necessary, accommodate 75 beds.

There are employed one chemist at \$1,800 per annum and one bacteriologist at \$1,800 per annum, both part time. The laboratory work is performed in the laboratories of the Creighton Medical College in Omaha, the city health department having no laboratory facilities of its own.

There is but one inspector employed in the milk-inspection division. He is required to inspect 85 near-by dairies, as well as perform the city work. The ordinance requires that all milk must be sold in the original package and must be either obtained from tuberculin tested cows or pasteurized. The tuberculin test is given once a year. The inspector has obtained some excellent results among the dairies selling raw milk as regards cleanliness of barns, milk houses, and animals, construction of concrete floors, use of small-topped milk pails, proper drainage, ventilation, etc. He has acted on the principle that expensive equipment is unnecessary, provided the principles of cleanliness are practiced. That good results have been obtained is proved by the bacteriological findings, the average on all samples for the year being approximately 37,000 bacteria per cubic centimeter.

There is, however, too much work for one man to do, and the inspector should be given an assistant for city work, so that he could devote more of his time to the inspection of dairies.

In the work of sanitary inspection, there are employed one restaurant inspector; one bakery and confectionery inspector; one sanitary plumbing inspector, whose special duties are to inspect places having old installations or using the surface privy; one sanitary inspector engaged in fumigating and placarding for communicable diseases; one meat inspector who looks after the sanitation of meat markets; two slaughterhouse inspectors who make ante and post mortem inspections of animals killed in slaughterhouses not under Government supervision; one clerk whose duty is to issue burial permits; and two clerks for general purposes.

The collection of garbage is under the control of the health department. From the residence sections it is collected once a week in winter and twice a week in summer, and from wholesale houses, hotels, and restaurants once a day throughout the entire year. Garbage is disposed of by feeding it to swine on a ranch located near the city. For the present this seems to be a satisfactory method and costs the city of Omaha nothing. By maintaining proper sanitary conditions on the ranch there should be no nuisance produced.

Rubbish is collected under private contract. It has been used for filling in low and insanitary places in the city limits, but on account

of complaints it was stopped and a new method used, which it is thought may not prove as satisfactory. Rubbish which of itself has little value becomes valuable when used to fill low, marshy land, since otherwise useless land may be reclaimed and nuisances such as mosquito-breeding areas done away with. If no garbage is deposited with the rubbish this practice should not be objectionable.

There is no adequate system of health supervision of schools in Omaha. It is highly desirable that such be inaugurated as soon as possible and placed in the health department for reasons of efficiency and economy.

During 1915 the health department received \$31,500 for public health work, and for 1916 the appropriation amounts to \$35,000. For the collection of garbage \$33,000 was expended during 1915. In addition to this there was an appropriation of \$7,000 for the maintenance of the isolation hospital.

The water supply for the city of Omaha is obtained from the Missouri River. It passes through six sedimentation basins and is treated by alum as a coagulant and by chlorine. The process furnishes good water, as determined by laboratory tests which are made daily by chemists employed by the city water department. A close check is also kept on the process of purification. The city is well sewered. The sewage passes into the Missouri River untreated.

Lincoln.—The health department of the city of Lincoln is engaged in the following activities: Collection of birth and death certificates, milk inspection, control of communicable diseases, including operation of isolation hospital, meat inspection, food inspection, sanitary inspection, gas inspection, inspection of weights and measures. The two latter activities have nothing to do with public health and should not be included in the work of a health department.

There are employed a full-time superintendent of health, who receives \$1,800 per year; a clerk, who is in charge of the birth and death reports, at \$780 per year; a deputy superintendent, who performs the necessary bacteriological work and the duties of a city physician (\$1,200 per year); a visiting nurse, at \$840 per year; two sanitary inspectors, one at \$960 per year and one at \$840; a food inspector, at \$960 per year; a meat inspector, who is a veterinarian and who receives \$1,200 per year; and an inspector who has charge of the inspection of milk and dairies and acts as the inspector of gas, weights, and measures (\$900 per year).

The amount received by the health department during 1915 was \$13,430, a sum inadequate properly to support a health department in a city of the size and importance of Lincoln. The health department is therefore handicapped in not having a sufficient number of employees to carry on its activities. All of the employees are full time.

The health department is a part of the department of public safety, presided over by a commissioner. There is also a board of health, composed of the mayor, commissioner of public safety, and four physicians, including the superintendent of health.

The visiting nurse is concerned in the control of communicable diseases. She exercises some health supervision over the children of the parochial schools, acting as school inspector as well as school nurse in such schools. She also visits families having newborn infants and instructs and supervises the work of the midwives of the city. The number of nurses should be increased to not less than three in order that they may perform all of the work which is usually required of them according to modern ideas, including prenatal work, child welfare, school hygiene, and the prevention of communicable diseases.

The city is fortunate in having an isolation hospital which will accommodate 35 patients.

School inspection, except for that already mentioned, is under the control of the educational department. This should be combined with the health department for efficiency as well as for reasons of economy.

Garbage is at present being collected under contract and dumped. The city is now contemplating the construction of an incinerator.

The water supply is obtained from deep wells and is treated with hypochlorite. Daily examinations show it to be of good quality.

The city is sewered and the sewage passes into a creek untreated.

Other cities.—In addition to Omaha and Lincoln there were visited the cities of Columbus, Grand Island, North Platte, Kearney, Hastings, Ashland, and Seward.

There is a health officer in all of these communities, but in no instance has he been furnished with any assistants.

Hastings has a small isolation hospital constructed of brick. On account of an outbreak of smallpox, Grand Island has rented temporarily a building. In a few instances, as for instance Kearney, the health officer is performing some laboratory work in his own laboratory. None was exercising any supervision over the milk supply. All the cities were supplied with water from bored wells, furnishing a water of a satisfactory nature and requiring no treatment. All were sewered and, with the exception of Hastings, disposed of their sewage untreated into rivers, creeks, or sloughs. Hastings uses a septic tank, the effluent passing into pits, where it evaporates and percolates through the soil, which is afterwards plowed. The plant is faulty in design in that for a part of the time the sewage must pass direct to the pits without passing through the tanks. Garbage is dumped. The collection of vital statistics in these communities seems to be satisfactory. All of the health officers

were more or less actively engaged in the proceedings required under the regulations to control the communicable diseases.

Each of the cities visited could well afford to furnish a public health nurse and a milk inspector to assist the health officer. The need for a State sanitary engineer was apparent in practically every community.

PUBLIC HEALTH ENGINEERING.

Requirements of laws.—The only law providing for the maintenance of the purity of water supplies is summarized as follows:

Whoever obstructs the course of any river or stream, thereby making an artificial pond or producing stagnant water which is injurious to the public health, is liable to a fine of not to exceed \$500, and the board is authorized to order such nuisance abated or removed.

It is prohibited to put any dead animal or part thereof or other filthy substance into any well or running water which is used for domestic purposes.

For violation there is provided a fine of not less than \$2 nor more than \$40.

Requirements of regulations.—The only regulation applying to the maintenance of the purity of water supplies is summarized as follows:

No person or corporation is permitted to furnish to any person or corporation for domestic purposes any water which has been condemned by the State board of health or from a source of supply which has been condemned, unless such water has been purified by some method approved by the State board of health, or unless the condemnation has been removed.

Discussion.—As in other States, many communities have problems of water supply and sewage disposal the solution of which has an extremely important bearing on the public health. There is no expert in the health department to assist communities in working out these problems. The bacteriologist devotes a great deal of his time to the analysis of water upon request of local officials, but much of this work, which is done without a knowledge of local conditions, is unsatisfactory and futile unless the results obtained are utilized in a practical manner by one with a thorough knowledge of the subject. It is highly important that there be organized in the health department a bureau of public health engineering in charge of a capable sanitary engineer, who could advise and assist local officials at the expense of the State. In rendering this assistance it would be necessary to make a survey to determine the requirements, draw up tentative plans, and inform the authorities as to the approximate cost. It would then be necessary for the sanitary engineer to exercise general supervision over the work of the contractors in order to determine whether or not the community was getting all that it was paying for. As has been pointed out in other reports, it is a common thing to find a small city supplied with a sewerage

system or a system of water supply entirely inadequate to meet the needs of the community and not giving the results that were to be expected. Such a condition as this could be easily avoided by securing the proper advice from the State sanitary engineer before any decision was made. In time it would be advisable to enact a comprehensive law giving supervisory control to the State board of health of all water supplies, public and private, sewerage systems, garbage-disposal systems, and systems for the disposal of trades wastes. As soon as possible a chemist should be added to the staff of the State board of health to perform the water and sewage analyses under the direction of the sanitary engineer.

DISSEMINATION OF INFORMATION.

A bulletin is published quarterly by the State board of health, containing articles and information which are of especial interest to the health officials of the State. This bulletin, however, is of little value as popular reading, and literature of such character is lacking. Circulars that would be of benefit to the laymen should be published without delay, to cover the subjects of typhoid fever, measles, whooping cough, diphtheria, tuberculosis, disposal of sewage, flies, etc.

As soon as the funds will permit, it is also suggested that a public health exhibit be acquired and shown in the different communities of the State, to be accompanied by lectures with moving pictures or lantern slides for the education of the people. It must be kept in mind that to bring the activities of the health department to a successful issue it is most essential to carry on an energetic educational campaign along the lines of public health.

Every year there is held a meeting of local health officers with the State health officials to discuss questions of public health interest. This is an excellent idea, and provision should be made by law whereby those attending the meeting could be reimbursed for traveling expenses by the locality which they represent.

HEALTH SUPERVISION OF SCHOOLS.

In a few of the cities there is maintained a system of health supervision of schools. This is very superficial and is in the hands of educational authorities rather than the health department. The public health nurse, as part of this system, is given minor importance as compared to the physician, whereas the reverse should be the case. It should not be necessary to point out the great value of the nurse in public health work and the advantages to be gained, both as to efficiency and economy when the health supervision of schools is made a part of the work of the health department.

In time it would be wise for the State board of health to organize a bureau of child welfare to take up the activities concerned with infant welfare, school hygiene, and the supervision of midwives in localities not already carrying on such activities.

THE CONTROL OF THE MILK SUPPLY.

The enforcement of the laws enacted for the maintenance of the purity of milk and dairy products has been placed in the hands of the commissioner of food, drugs, dairies, and oils. In this office there are employed 16 inspectors throughout the year and an additional 6 during the summer months. Some of these inspectors are given regular districts in which they carry on all of the activities pertaining to the office of the commissioner, while some are detailed to perform certain specific duties.

In addition to a supervision of the milk supply not only on the producing farm, but at creameries and all other places handling milk, inspectors are also required to enforce those regulations relating to the maintenance of sanitation in places selling, preparing, or handling food products.

A few of the cities have employed inspectors to maintain the purity of milk furnished to their citizens, but the great majority have not thought this necessary, although large enough to take an active part in this important health work.

It is quite impossible for the State to exercise the control over the milk supply that is needed without some assistance from the locality. It is suggested that the health department, with a proper organization and some necessary field men, would be able to cooperate with the food and drug commissioner and assist him in enforcing the regulations promulgated for the purpose of maintaining the cleanliness of the milk supply.

APPROPRIATIONS AND EXPENDITURES.

Expenditures.—The itemized expenses incurred by the State board of health during 1915 are presented in the following table:

Tabulation of expenditures, State board of health, calendar year 1915.

| | State medical board. | General adminis- tration. | Epidem- iology. | Vital statist- ics. | Educa- tional. | Diagnos- tic labor- atory. | Total. |
|---|----------------------------|---------------------------------|--------------------|---------------------------|-------------------|----------------------------------|---------|
| Antitoxins and vaccines..... | | | | | | \$35.00 | \$35.00 |
| Badges..... | | | \$1.00 | | | | 1.00 |
| Binding..... | | | | \$80.25 | | | \$80.25 |
| Books..... | | | 5.00 | | | 1.50 | 6.50 |
| Drugs, chemicals and disinfectants..... | | | 1.65 | | | 49.74 | 51.39 |
| Dues to societies and associations..... | | \$10.00 | | | | | 10.00 |
| Express and freight..... | \$0.63 | | | 3.05 | \$5.28 | | 8.96 |
| Gas and electricity..... | | | | | | 33.92 | 33.92 |
| Ice..... | | | | | | 14.13 | 14.13 |

Tabulation of expenditures, State board of health, calendar year 1915—Continued.

| | State medical board. | General adminis- tration. | Epidem- iology. | Vital statis- tics. | Educa- tional. | Diagnos- tic labor- atory. | Total. |
|-----------------------------------|----------------------------|---------------------------------|--------------------|---------------------------|-------------------|----------------------------------|----------|
| Installation of equipment..... | | | | | | \$7.35 | \$7.35 |
| Laboratory supplies..... | | | | | | 19.80 | 19.80 |
| Licenses to practice..... | \$24.70 | | | | | | 24.70 |
| Maps..... | | | \$4.40 | | | | 4.40 |
| Miscellaneous..... | | \$3.55 | .75 | | | | 4.30 |
| Office furniture..... | | | | \$40.25 | | | 40.25 |
| Office supplies..... | 1.25 | | 2.50 | 107.35 | | | 111.10 |
| Printing..... | | | 21.50 | 292.17 | \$411.30 | 5.50 | 730.47 |
| Rent..... | | | | | 15.00 | | 15.00 |
| Repairs to furniture..... | | | 1.00 | 11.50 | | | 12.50 |
| Salaries: | | | | | | | |
| Medical officers..... | | | 1,800.00 | | | | |
| Bacteriologist..... | | | | | | 2,400.00 | |
| Clerks..... | 120.00 | | | 1,680.00 | | | 6,249.99 |
| Laboratory attendant..... | | | | | | 249.99 | |
| Stamps, postage, and revenue..... | 43.00 | | 1.00 | 179.80 | 15.72 | 50.00 | 289.52 |
| Stationery..... | 71.06 | | 19.25 | 113.60 | 56.58 | 39.05 | 299.54 |
| Telephone and telephone..... | 30.97 | 87.35 | 22.89 | | | 69.48 | 210.69 |
| Traveling expenses..... | | | 280.88 | | 6.30 | | 287.18 |
| Typewriters and repairs..... | | | | 88.90 | | | 88.90 |
| Total..... | 291.61 | 100.90 | 2,161.82 | 2,596.87 | 510.18 | 2,975.46 | 8,636.84 |

Appropriations.—There were appropriated to the State board of health for the biennial period 1915 and 1916 the following amounts:

| | |
|--|----------------|
| Salary of a State health inspector..... | \$3,600 |
| Salary of a stenographer..... | 1,680 |
| Salary of a clerk..... | 1,680 |
| Salary of a bacteriologist..... | 4,800 |
| | <hr/> \$11,760 |
| Incidentals, books, blanks, etc., for State board of health..... | 5,500 |
| Traveling expenses..... | 500 |
| Books, blanks, stationery, telephone, etc., for laboratory..... | 2,000 |
| | <hr/> 8,000 |
| Total..... | <hr/> 19,760 |

This total is equivalent to \$9,980 per annum.

There was collected by the State during 1915 in general taxation the sum of \$2,934,981.59, which, with a balance from the previous year, \$70,571.33, makes a total income from this source of \$3,005,552.92. Computing the amount that should go to public health on the 2 per cent basis, it will be seen that the State board of health would have received \$58,699.62 per annum. At the end of the year 1915 there was a balance of \$132,314. If the amount mentioned above had been appropriated to health work, there would still have been \$73,614.59 remaining in the Treasury. The total amount of money collected by the State from all sources, plus the balance from the previous year, was \$7,244,498.60. There was expended during the same period \$6,753,207.87, leaving a balance at the end of the year of \$1,284,008.82. The amount actually received by the State board of health represents but thirty-three one-hundredths of 1 per cent of the amount available

through general taxation, a sum entirely inadequate to meet the public health needs of the State.

Following out the suggestions that have been made in this report, there would be required for the present an annual appropriation of \$24,700 to be used in the maintenance of the health department, including salaries. The employees who are required under the plan of reorganization and who are to be paid out of the above amount include a State health officer or executive officer of the board of health, an epidemiologist to be chief of the bureau of epidemiology, a sanitary engineer to be chief of the bureau of public health engineering, a statistician to be chief of the bureau of statistics, a bacteriologist, a laboratory attendant, and four clerks and stenographers.

There are six new positions created, viz, the State health officer, the sanitary engineer, the laboratory attendant, and three clerks and stenographers. The position of epidemiologist is now represented by that of the State health inspector, and this position should be done away with and that of epidemiologist, or chief of the bureau of epidemiology, created and filled by promoting the State health inspector. The position of statistician is now represented by that of vital statistics clerk. It might be created and filled by the promotion of the one occupying the position of clerk. The position of bacteriologist is already provided for.

Larger quarters for the State health organization should be provided in the capitol, as the amount suggested above would be inadequate were the extra expense of rent to be incurred.

MISCELLANEOUS.

Hotel inspection.—The laws enacted for the purpose of maintaining sanitary conditions in hotels and providing for the safety and comfort of guests have been placed for their enforcement in the hands of a deputy hotel commissioner, who has an inspector to assist him. It would seem wise to place the hotel inspection under the board of health, thus making available to that body an additional field force which could, in addition to hotel inspection, inspect other conditions in the communities visited.

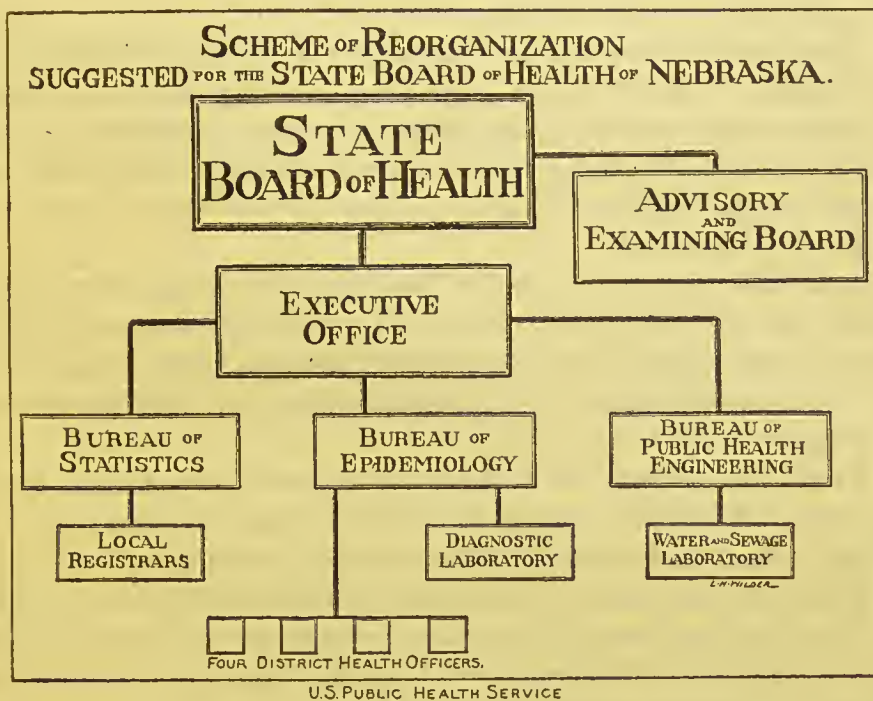
The orthopedic hospital.—In addition to other State institutions there has been established an orthopedic hospital, which is of more or less interest from the public health standpoint, inasmuch as its purpose is to correct deformities and thus make useful citizens out of children who might otherwise be charges upon the community during adult life. The work of the hospital, however, is more of a relief than of a public health nature and must, therefore, be considered as such an institution.

RECOMMENDATIONS.

After a thorough study of the State board of health and careful consideration of the public health needs of the State, the following recommendations are offered:

1. That the name of the State health organization be changed to the State department of health.

2. That a full-time State health officer to act as executive officer of the board of health be appointed by the State board of health, at a salary of not less than \$3,000 per annum; that the State health officer be a physician with previous experience in public health work, and that he hold his office as long as he renders efficient services to the State; that he receive his appointment only after passing a com-



petitive examination before the board of health and the advisory board.

3. That the State department of health be organized into the State board of health, the executive office, a bureau of epidemiology, a bureau of public health engineering, and a bureau of statistics.

4. That the bureau of epidemiology be placed in charge of a full-time epidemiologist, to be appointed by the State board of health upon the recommendation of the State health officer, that he hold his position as long as he renders efficient service to the State, and that his salary be not less than \$2,500 per year.

5. That a full-time sanitary engineer be placed in charge of the bureau of public health engineering, that he be appointed by the board of health upon the recommendation of the State health officer

at a salary of not less than \$2,000 per annum, and that he hold his office so long as he renders efficient services to the State.

6. That a full-time registrar be placed in charge of the bureau of statistics, that he be appointed by the State board of health upon the recommendation of the State health officer, at a salary of not less than \$1,200 per annum, and that he hold his office as long as he renders efficient service to the State.

7. That the position now designated State health inspector be changed to that of chief of the bureau of epidemiology.

8. That in addition to the above the personnel of the State department of health be increased by the addition of one laboratory attendant and at least three clerks.

9. That all of the employees of the health department be full time and hold their office during efficiency.

10. That the bureau of epidemiology be made responsible for the collection of information regarding the prevalence of disease and for the enforcement of the State laws and regulations relating to morbidity reports, the control of preventable diseases, the work of the diagnostic laboratory, and the supervision of the activities of local health authorities.

11. That the bureau of public health engineering be made responsible for the activities concerned in the maintenance of the purity of water supplies, the disposal of sewage, garbage, and trades wastes, and the laboratory work entailed in the analysis of water and sewage.

12. That the bureau of statistics be made responsible for the registration of births, deaths, marriages, and divorces, and the compilation and tabulation of data relating thereto.

13. That the laboratory be divided into two parts, the diagnostic and the water and sewage laboratory; that the former be made a division of the bureau of epidemiology and the latter a division of the bureau of public health engineering.

14. That the work of the laboratory be extended both in amount and in scope so that the physicians and health officers of the State may have greater facilities to assist them in the diagnosis of communicable diseases.

15. That energetic efforts be made without delay to secure the notification of reportable diseases and complete birth and death registration.

16. That educational literature on the different subjects of public health be published by the State board of health and distributed among the citizens of the State.

17. That a public health exhibit be acquired by the State board of health and exhibited in the different communities of the State, accompanied by lectures and moving pictures.

18. That the advisory board be retained as an examining board and in a purely advisory capacity—i. e., to give advice when called upon by the State board of health but to have no administrative or controlling function.

19. That the advisory board meet jointly with the State board of health upon the call of the president of the board of health.

20. That not less than \$24,700 per annum be appropriated to the State board of health to be used in the following manner, at the discretion of the State board of health:

| | Per annum. |
|--|------------|
| 1 State health officer, at not less than----- | \$3, 000 |
| 1 epidemiologist, at not less than----- | 2, 500 |
| 1 sanitary engineer, at not less than----- | 2, 000 |
| 1 bacteriologist, at not less than----- | 1, 800 |
| 1 registrar, at not less than----- | 1, 200 |
| 1 laboratory attendant----- | 840 |
| 4 clerks and stenographers, at \$840----- | 3, 360 |
| Maintenance of health department, including traveling expenses, laboratory expenses, printing, etc.----- | 10, 000 |
| Total----- | 24, 700 |

21. That larger quarters for the State department of health be provided in the statehouse at Lincoln.

22. That a record of the expenditures be kept by the State department of health, according to the nature of the expense and the bureau incurring it, so that the cost of maintaining any bureau, or the cost of any activity, may be determined without delay.

23. That the regulations of the State board of health be amended to provide for vaccination against smallpox.

The above recommendations are made for the purpose of placing the State health organization in Nebraska on a par with the health organizations of other States having progressive State health departments, as well as to provide an adequate organization for carrying on the public health work immediately required. This will require some legislation.

In addition to the above it will be necessary to add to this organization in the future, and for this purpose the following recommendations are made:

24. That as soon as practicable a chemist be employed to be placed in charge of the water and sewage laboratory under the direction of the sanitary engineer.

25. That the State be divided into not less than four districts, each district to have a full-time district health officer, who must be a physician with previous experience in public-health work, and to receive not less than \$1,800 per annum; that district health officers be made responsible to the State health officer and the epidemiologist

for the efficiency of their work and that they hold office as long as they render satisfactory services to the State; that they perform within their districts all the work required of a public health official, including the collection of morbidity reports and the control of communicable diseases, the delivery of public health lectures, the supervision of local health authorities, supervision over the milk supply, registration of births and deaths, the health supervision of schools in rural districts, etc.

26. That in order to defray the expenses of the district health organization, including the salary of the district health officers and assistants, and necessary traveling expenses, there be appropriated the sum of \$20,000, or \$5,000 for each district.



PRESENTED BY
PROF. G. H. F. MUTTAK

UNITED STATES PUBLIC HEALTH SERVICE
RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION
IN YOUNGSTOWN, OHIO

BY

CARROLL FOX

Surgeon, United States Public Health Service

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PUBLIC HEALTH ADMINISTRATION IN YOUNGSTOWN, OHIO.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of health organization and administration in the city of Youngstown, Ohio. The study was carried on from May 15 to July 1, and includes investigations in the office and in the field.

Youngstown is a prosperous community in the northeastern part of the State, located on both sides of the Mahoning River. The city has an area of 25 square miles and includes what was originally an entire township. It is served by four trunk-line railroads: The Erie, Baltimore & Ohio, Pennsylvania, and New York Central. The Mahoning River is not a navigable stream.

Youngstown is essentially an iron and steel manufacturing center. Among its other industries are plants for the manufacture of products made from rubber, gas mantles, oilcloth, mazda bulbs, leather, cigars, etc.

The population figures used in this report were obtained from the United States Census Bureau, which estimates the population as of July 1, 1915, at 104,489. Of this number approximately 65 per cent are foreigners, who work in the iron and steel mills.

Little mention of State law has been made in this report, except as it relates to the powers and duties of the city board of health. Such part of it as is necessary to the subject has already been summarized in the report on health organization and administration in Toledo, Ohio.²

Adjoining the city of Youngstown, and practically a continuation of it, is the village of East Youngstown, in which is located one of the larger steel mills. This village has a population of about 9,000 people, most of whom are foreigners.

For assistance and information received during the course of this study, acknowledgment is made to the officials of the health and other city departments, the chamber of commerce, especially its secretary and the chairman of the committee on public health, and to those citizens connected with the various charitable organizations or otherwise interested in public health.

ADMINISTRATION AND ORGANIZATION.

The city health organization is under the administration of a board of health, which appoints a health officer as its executive officer. The board, together with its powers and duties, is provided for by statute.

¹ Reprint from the Public Health Reports, vol. 31, No. 39, Sept. 29, 1916, pp. 2653-2685.

² Reprint No. 284 from the Public Health Reports.

Membership of the board.—The board of health consists of five members, appointed by the mayor. No special qualifications are necessary. The mayor by virtue of his office is president, but the board is authorized to elect a president pro tempore to act in the absence of the mayor.

Term of office of members.—Members of the board are appointed for a term of five years, a term expiring and a new member being appointed each year.

Meetings of the board.—The board meets regularly once a month and as much oftener as is necessary to transact business. Provision is made for special meetings at the call of the president or of three of its members.

Salary and expenses of members.—Members of the board receive no salary.

Powers and duties.—The board of health is given the authority by statute to promulgate regulations for its own government and for the control of disease and the betterment of the public health. Regulations intended for the general public when “adopted, advertised, recorded, and certified” as are ordinances of municipalities, must be recognized by the courts as having the same force as ordinances adopted by the council. For violation of any such regulation there is provided a fine of not to exceed \$100 or imprisonment not to exceed 90 days, or both.

The board must appoint a health officer, but no special qualifications for the position are specified in the statute.

The board may appoint a clerk to have general charge of the records and reports and the proceedings of the board.

With the consent of the council the board may also appoint “ward physicians” and as many persons for sanitary duty as may be required. These latter employees have general police powers and are designated “sanitary police.” All appointments are made according to civil-service regulations.

The board is given exclusive control over its employees. It may define their duties and fix their salaries, and they serve during its pleasure.

The board is further given authority by statute to employ guards to maintain quarantine; to appoint a local registrar under civil-service regulations; to abate “nuisances”; to regulate the location, construction, and repair of “yards, pens, and stables,” and the use, emptying and cleaning thereof, as well as of water-closets, privies, cesspools, sinks, plumbing, drains, etc., and to abate all nuisances or correct all conditions detrimental to health or well-being found on school property, by serving notice on the board of education. A fine is provided for failure to comply with an order, and authority is given to the board of health to employ inspectors of schools and school buildings to maintain sanitary conditions.

Where plumbing and sewerage are feasible and necessary but neglected or "refused" in any building, the board may take the necessary action to require correction or may correct the condition, in which event the cost must be assessed against the property.

When necessary, the board of health may impose a quarantine on vehicles of common carriers and may make rules and regulations to restrict communicable diseases disseminated by persons traveling in such vehicles. It is also empowered to investigate houses or localities in which communicable disease is suspected to exist; to quarantine at home or in a suitable place, cases of quarantinable diseases; to placard houses containing certain diseases; to disinfect after communicable diseases; to destroy infected articles or buildings under certain conditions; to provide everything necessary to persons in quarantine, the expense so incurred, except for those measures imposed strictly for the protection of the public health, to be borne by the individual quarantined, if able to pay, and if not, by the municipality; to take measures, supply agents, and afford inducements and facilities for gratuitous vaccination; to close schools and prevent public gatherings during epidemics, threatened epidemics, or when a dangerous communicable disease is unusually prevalent; to maintain health supervision of schools or to cooperate with the school board in maintaining such supervision; to appoint inspectors for maintaining the purity of foods; to inspect maternity boarding houses and lying-in hospitals; to make to the State the necessary reports relating to morbidity and mortality or any special reports required, and to make to the State board of health and the municipal council an annual report on or before January 15.

The activities engaged in by the city board of health are: Registration of births and deaths, control of disease, inspection of milk, meat, and other foods, laboratory work, abatement of nuisances, plumbing inspection, and collection of garbage by contract.

Personnel.—At present the personnel of the health department, exclusive of the board of health, and their respective salaries, are as follows:

| | |
|-------------------------------------|----------|
| 1 health officer (part time)..... | \$1, 000 |
| 1 secretary and bacteriologist..... | 1, 800 |
| 1 food and dairy inspector..... | 1, 200 |
| 1 meat inspector..... | 960 |
| 1 plumbing inspector..... | 1, 800 |
| 1 assistant plumbing inspector..... | 1, 320 |
| 1 chief of sanitary police..... | 1, 200 |
| 5 sanitary police, at \$960..... | 4, 800 |
| 2 stenographers, at \$600..... | 1, 200 |
| 1 stenographer (part time)..... | 240 |
| 1 garbage weight master..... | 900 |
| Total..... | 16, 420 |

Office hours.—The office and laboratory, located in the city hall, are open every week day from 8 a. m. until 5 p. m. and Saturdays

from 8 a. m. until 12 o'clock noon. There is allowed one hour for lunch. On Sundays and holidays sufficient time is spent in the laboratory by the bacteriologist to perform any emergency work that may be required.

The working hours of the sanitary police conform to those of the office, except that half of the force is on duty Saturday afternoon and emergency work is performed on holidays. The sanitary police are in fact subject to call at any hour, day or night.

All employees are entitled to a vacation of two weeks each year.

Transportation.—The chief of the sanitary police, the milk inspector, and each of the plumbing inspectors are furnished with an inexpensive two-passenger automobile. In addition to the above the health department owns a two-horse ambulance, which is used only for conveying smallpox patients to the detention hospital. Horses are hired as needed. Sanitary police and inspectors of the health department may ride free on the street cars upon showing their badge.

Discussion.—The present health officer is a part-time official and has held his office for many years. He has had, therefore, unusual opportunities to become familiar with the diagnosis and prevention of the common communicable diseases.

It should be noted that Youngstown, except for the bacteriologist, is lacking in those subordinate officials, such as an epidemiologist and public health nurses, who are directly concerned with the control of disease. In carrying out the provisions of State law granting authority to the board of health to appoint sanitary police, it has been the custom to appoint sanitary policemen without technical knowledge rather than sanitary policewomen with the qualifications of public health nurses. As a result of the present organization, it is possible to apply preventive measures only from the old point of view of a supervision over the environment rather than from the modern point of view of a supervision over the individual.

It is obvious that the city of Youngstown is of sufficient size and importance to employ a full-time health officer. It is likewise evident, after a careful study of the situation, that the immediate need of field work of a technical nature is urgent and the amount required great, and that it would be impracticable if not impossible for one whole-time man to perform it and carry on at the same time the necessary administrative duties.

For reasons of economy it would therefore seem wise to defer placing the health officer on a whole-time basis until some future date and to appoint without delay an epidemiologist to devote his entire time to the field work. He would act as the assistant to the health officer and should have as his assistants an efficient corps of public health nurses. Thus the executive work would be performed as at present and new activities would be carried on by the addition of a force of scientific workers.

THE REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths in the city of Youngstown is provided for by statute. The clerk of the city board of health has been appointed local registrar, the city of Youngstown forming a primary registration area. The reports of births and deaths are recorded with care and accuracy, and as nearly as can be determined all of the deaths are registered.

Registration of deaths.—During the year 1915 there were recorded in the health department 1,404 deaths, exclusive of stillbirths, making a crude death rate of 13.4 per thousand. Of these deaths, 116 occurred in nonresidents. Subtracting this figure from the total number of deaths, there remain 1,288 deaths, giving a death rate corrected for deaths in nonresidents of 12.3. To this should be added the unknown number of deaths of residents of Youngstown which occur outside of Youngstown.

There were during the year 1915, 146 stillbirths, a number which might have been decreased by proper prenatal supervision.

Preventable deaths.—There were during the year 1915, 876 deaths ascribed to preventable causes. This is 68 per cent of the total deaths.

The following table gives these deaths more specifically and the indicated death rate per 100,000, together with the number of cases of disease reported to the health department and the indicated case fatality rate.

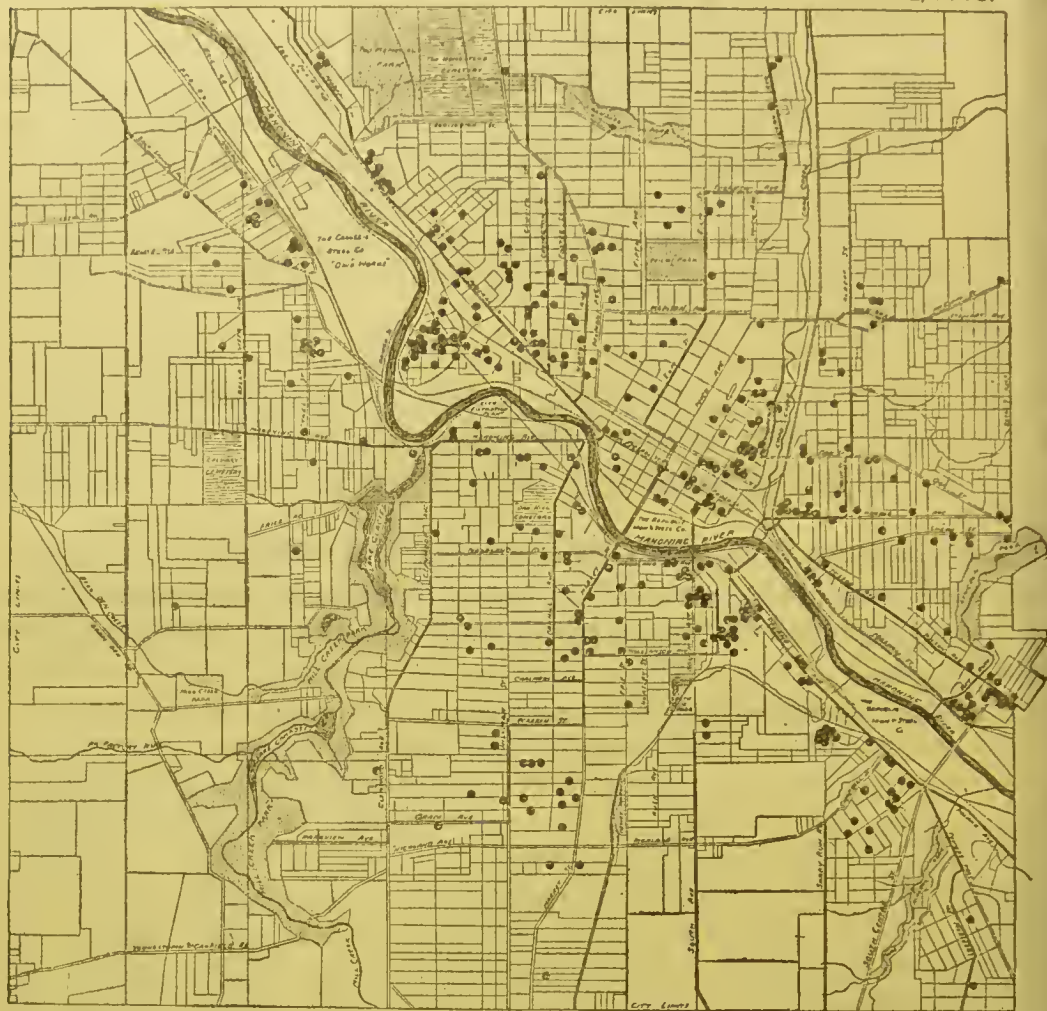
Deaths registered as from preventable causes, all ages, calendar year 1915.

| Disease. | Number of deaths registered. | Indicated death rate per 100,000. | Number of cases reported. | Indicated case fatality rate. |
|---|------------------------------|-----------------------------------|---------------------------|-------------------------------|
| | | | | <i>Per cent.</i> |
| Typhoid fever..... | 21 | 19.9 | 97 | 21.6 |
| Smallpox..... | 2 | 1.9 | 284 | .7 |
| Measles..... | 2 | 1.9 | 388 | .5 |
| Scarlet fever..... | 6 | 5.7 | 175 | 3.4 |
| Whooping cough..... | 6 | 5.7 | 387 | 1.5 |
| Diphtheria..... | 8 | 7.6 | 144 | 5.5 |
| Tuberculosis, pulmonary..... | 80 | 76.5 | 275 | 29.0 |
| Tuberculosis, other forms..... | 17 | 16.2 | | |
| Pneumonia..... | 236 | 225.8 | | |
| Diarrhea and enteritis..... | 120 | 114.8 | | |
| Erysipelas..... | 3 | 2.8 | | |
| Rabies..... | 2 | 1.9 | | |
| Tetanus..... | 6 | 5.7 | | |
| Syphilis..... | 21 | 20.0 | | |
| Influenza..... | 6 | 5.7 | | |
| Dysentery..... | 1 | | | |
| Septicemia, including puerperal..... | 18 | | | |
| Meningitis, tuberculous excepted..... | 11 | | | |
| Bronchitis..... | 9 | | | |
| Abscess..... | 2 | | | |
| Malignant growths..... | 62 | 59.3 | | |
| Accidental..... | 70 | 66.9 | | |
| Premature birth..... | 68 | | | |
| Congenital debility, lack of care, etc..... | 59 | | | |
| Other conditions peculiar to early infancy..... | 40 | | | |
| Total..... | 876 | | | |

Infant mortality.—Of the 1,404 deaths in 1915, 379 occurred in infants under 1 year of age. For practical purposes the latter

may be classed as preventable. The indicated infant mortality rate for the city during 1915 was 157.1. The accompanying map indicates that the deaths in children under 1 year occur mainly within those sections of the city inhabited by the foreign population. The following table gives the registered causes of these deaths:

CITY OF YOUNGSTOWN, OHIO.
INFANT-MORTALITY. MAP SHOWING LOCATION OF DEATHS IN CHILDREN UNDER 1 YEAR OF AGE, 1915.



● SIGNIFY DEATHS

U.S. PUBLIC HEALTH SERVICE.

L. H. FIDELL

Registered causes of deaths in infants under 1 year, mostly preventable, calendar year 1915.

| Disease. | Number of deaths registered. | Percentage of total deaths under 1 year. | Disease. | Number of deaths registered. | Percentage of total deaths under 1 year. |
|---------------------------------------|------------------------------|--|---|------------------------------|--|
| Scarlet fever..... | 1 | 0.25 | Bronchitis..... | 2 | 0.52 |
| Measles..... | 1 | .26 | Pneumonia..... | 86 | 22.69 |
| Whooping cough..... | 4 | 1.05 | Diarrhea and enteritis..... | 92 | 24.27 |
| Diphtheria..... | 1 | .26 | Accidental..... | 5 | 1.31 |
| Influenza..... | 2 | .52 | Premature birth..... | 68 | 17.94 |
| Erysipelas..... | 2 | .52 | Congenital debility, lack of care, etc..... | 59 | 15.56 |
| Tetanus..... | 1 | .26 | Other causes peculiar to early infancy..... | 40 | 10.55 |
| Tuberculosis, other forms..... | 3 | .78 | | | |
| Syphilis..... | 9 | 2.37 | | | |
| Meningitis, tuberculous excepted..... | 3 | .78 | Total..... | 379 | 99.90 |

Registration of births.—There were reported to the health department during 1915, 2,412 births, exclusive of still births, making an indicated birth rate of 23 per thousand.

EPIDEMIOLOGICAL ACTIVITIES.

The Notification of Diseases.

The notification of diseases is required by regulations of the State board of health. These regulations are based on the model law for morbidity reports.

Methods of procedure.—In reporting diseases physicians usually make use of the telephone. The information reported is taken down by a clerk in the health department. It is then transcribed to a card, which is referred to one of the sanitary police for his information. After he has taken the proper action relative to placarding, etc., the card is filed away. Each disease reported is also recorded in a book.

The morbidity report cards supplied by the State board of health are not utilized to any great extent by physicians.

The city reports its diseases to the State board, as required, at the end of each month in a summarized report

Control of Diseases.

Requirements of regulations.—The regulations of which the following is a summary were passed in 1893 and are rather general in nature. Nothing has been added since that time, except a regulation making chicken-pox a quarantinable disease and an extensive ordinance applying to nuisances and their abatement. The regulation relating to chicken-pox was promulgated in 1915 on account of the prevalence of smallpox.

In the case of certain of the notifiable diseases the health officer is required to placard the premises, and it is unlawful for any person to remove such placard without authority.

Where an attempt is made to conceal the true nature of the disease, it becomes the duty of the health officer to appoint one or more physicians to decide upon the case by actual inspection of the patient.

Within three days after the discharge or death of any patient, the attending physician, or head of the household, must notify the health officer in writing. The health officer is empowered to remove a person suffering with a communicable disease to an isolation hospital, and may require all contacts to be confined within the house or to be removed to the isolation hospital.

School authorities are forbidden to receive into any school a pupil coming from a family in which there is a case of chicken-pox, cholera, yellow fever, typhus fever, smallpox, scarlet fever, diphtheria, measles, or whooping cough, except upon the presentation of a certificate from the health officer. School authorities are forbidden to receive into any school a pupil not vaccinated within the preceding five years unless said pupil has had smallpox. When entering school every pupil is required to bring a certificate from a physician stating that he or she has been vaccinated within the preceding five years or has had smallpox. No child must be permitted by parents or guardians to attain the age of one year without having been vaccinated. No person having smallpox or other communicable disease is permitted to expose himself in the public streets, public conveyances or vehicles, nor is it permitted

for a driver or owner of any such conveyance or vehicle knowingly to transport such person. Where a person suffering from a communicable disease has been transported in any public vehicle, the same must be disinfected. It is unlawful to sell, lend, etc., any clothing, rags, bedding, or other things which have been exposed to infection.

It is forbidden to take a body dead of any one of the diseases mentioned above into any church, lecture room, chapel, or public place. In the case of persons dead of smallpox, cholera, yellow fever, scarlet fever, diphtheria, or typhus fever, directions are given in the regulations for preparing the body, and public funerals are prohibited.

No person, except the physician, is permitted to enter a house where any of the above diseases are being treated, without permission from the health officer, or until the case has fully recovered and the necessary disinfection been practised.

Method of procedure.—The card on which is noted the report of a case of notifiable disease is turned over to one of the sanitary police in whose district the case has occurred. He visits the house and placards it. The card is then placed in the daily reminder file until quarantine has terminated, when it is filed away permanently. After the termination of quarantine a sanitary policeman performs the required fumigation. In the case of typhoid fever a special form has been devised on which is noted the epidemiological data obtained by the chief sanitary police. Every case of suspected smallpox is seen by the health officer. The methods pursued in preventing the spread of communicable diseases are shown in the tabulation.

*Typhoid fever.*¹—The registered death rate per 100,000 from typhoid fever during the year 1915 was 19.9. There were 97 cases reported with 21 deaths. The high case-fatality rate, 21.6 per cent, indicates that there were a number of cases of typhoid fever occurring in the city which were unreported, unrecognized, or concealed.

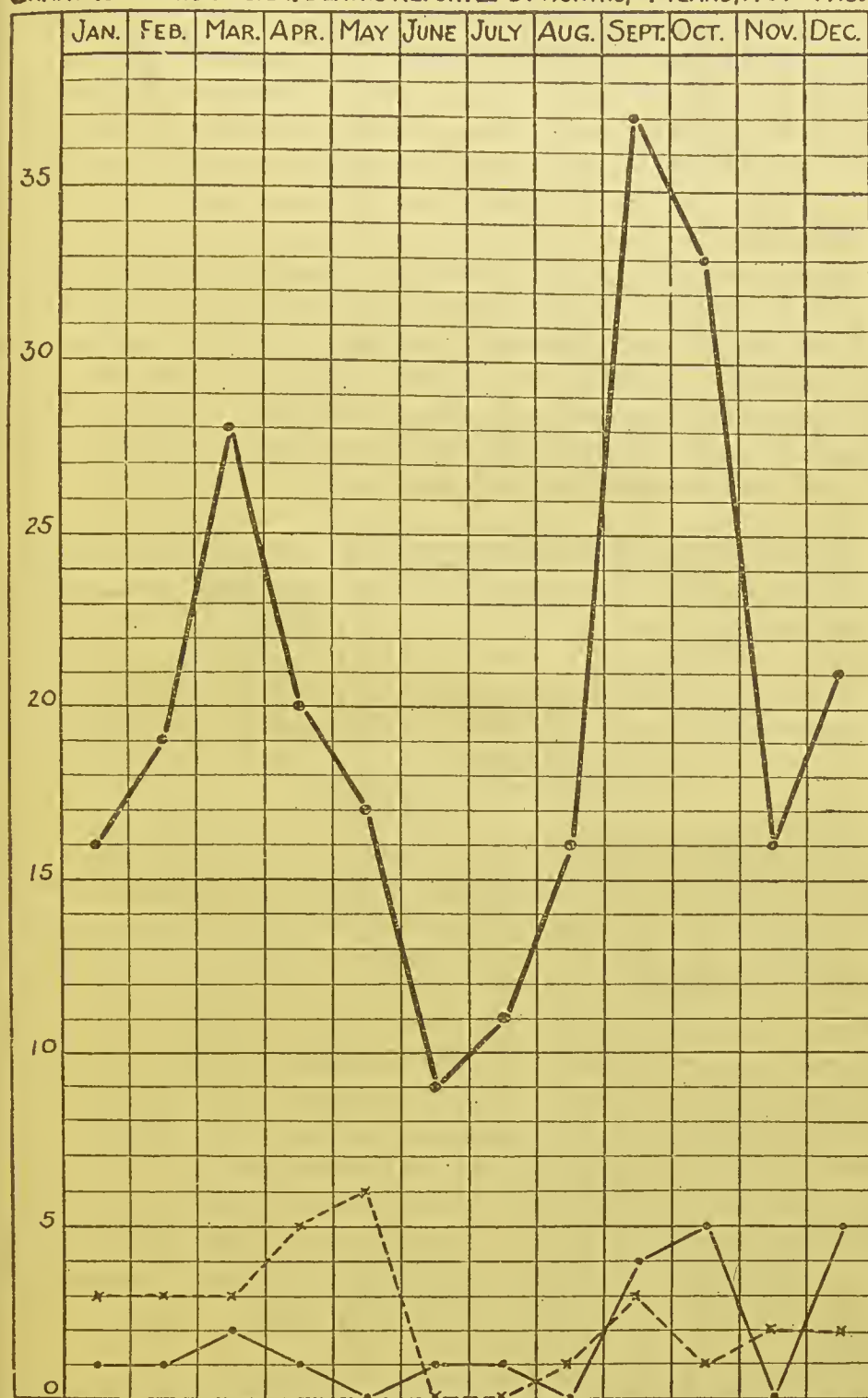
A study of the typhoid curve by months (Charts 1 and 2) shows two distinct peaks, one in the spring and one in the fall. The epidemiological record of typhoid fever can not be considered sufficiently accurate or extensive to base conclusions upon, but it is likely that much of the typhoid fever arises from contact with patients or carriers, and from flies.

A large percentage of the typhoid fever was found in houses within the sewered districts and the epidemiological records show that of the houses investigated, 76 in number, 55 had sewer connections. The households of 26 only were using city water, the others deriving their drinking water from dug or drilled wells or springs. In seven instances more than one member of a household became infected, the number of cases in each family being as follows: 4, 3, 3, 2, 2, 3, 3.

A study of the methods used at the water purification plant and of the results usually obtained permits one to exclude the city water as a cause of the continuance of typhoid fever.

¹ See Charts 1, 2, and 3.

CHART 1.- TYPHOID FEVER. DEATHS REPORTED BY MONTHS, 9 YEARS, 1907-1915.



————— = DEATHS FROM TYPHOID 1915.
 - - - - - = " " " 1914.
 U.S. PUBLIC HEALTH SERVICE.

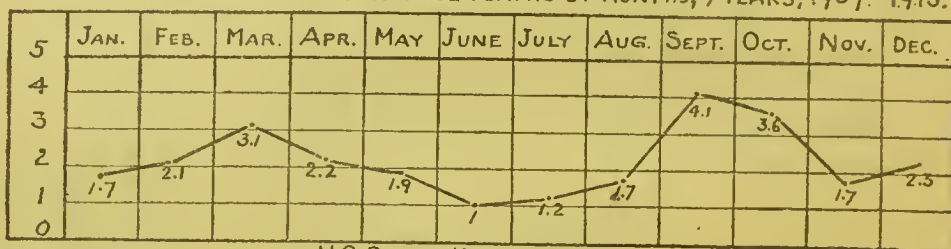
L.H. WILDER.

It is estimated that 90 per cent of the milk supply is pasteurized, and a study of the epidemiological records of typhoid fever on file in the health department for 1915 would seem to indicate that milk does not play any part in the spread of the disease. However, the methods of pasteurization are so varied and the technique of operation is so faulty in many instances that milk as a factor in the spread of typhoid fever can not be excluded. A thorough study is necessary relative to the efficacy of pasteurization as practiced in Youngstown.

The surface privy is unquestionably dangerous when open to flies, and all such privies should therefore be abolished. Until this can be accomplished they should be screened. Shallow wells no doubt play a part in the continuance of the infection and should be eliminated as soon as, or where, city water is available.

Smallpox.—There were reported to the health department during 1915, 284 cases of smallpox with two deaths.

CHART 2.—TYPHOID FEVER. AVERAGE DEATHS BY MONTHS, 9 YEARS, 1907-1915.



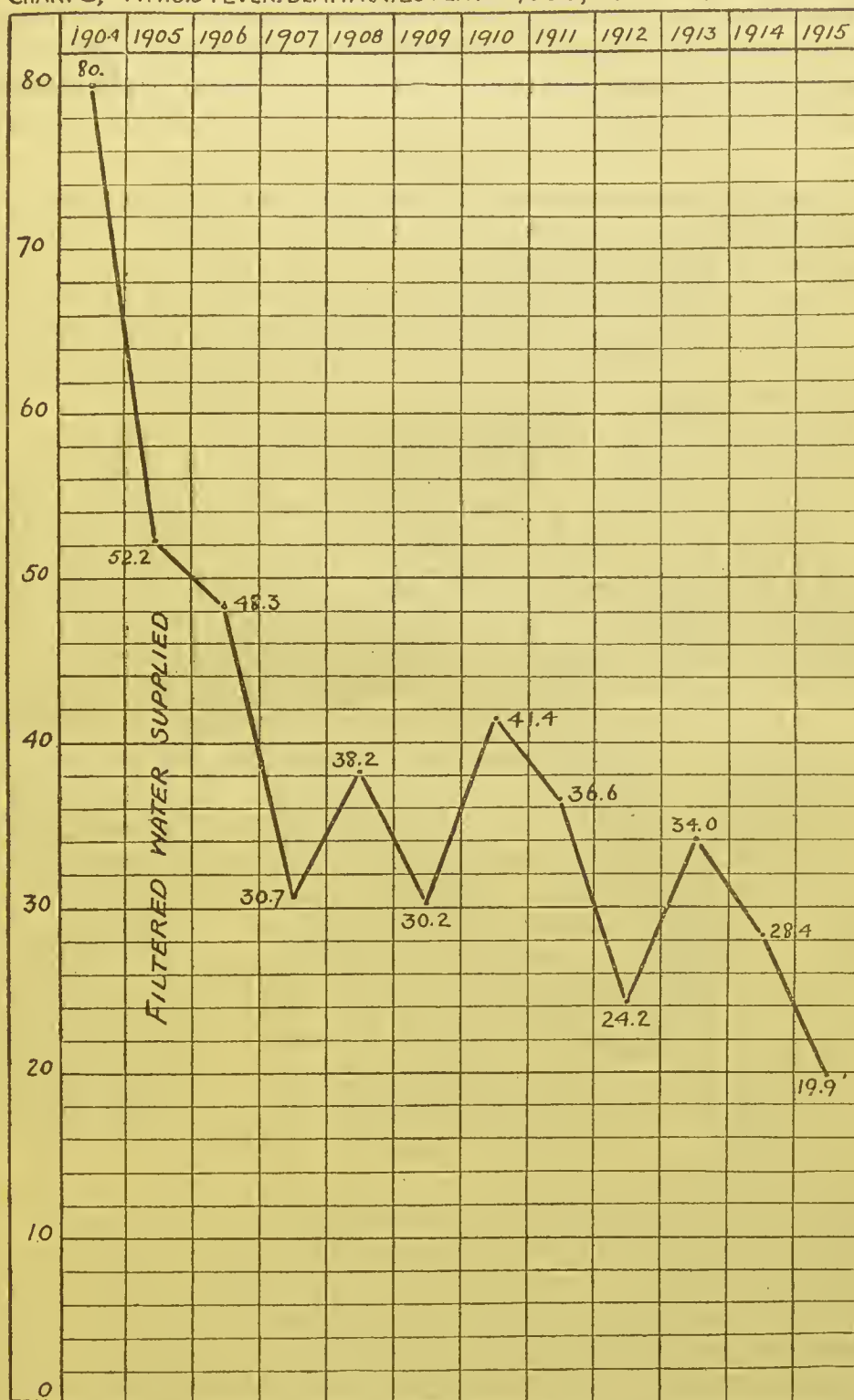
— U.S. PUBLIC HEALTH SERVICE.

Only those cases that occur in persons in boarding houses or hotels, or those who have no homes are taken to the isolation hospital. Other patients are quarantined at their homes, meaning an expense for maintenance which the city is required to meet and frequently the expense of employing guards to enforce quarantine. The former expense in 1915 was \$861.65 and the latter \$1,091.35. The entire cost to the city on account of smallpox during the year 1915, including the erection of a temporary hospital, supplies and attendants for the hospital, maintenance of quarantine at homes and medical services was \$4,724.51. This does not include the time occupied by the health officer and the various sanitary inspectors engaged in inspecting, placarding, disinfecting, etc. Vaccination of contacts is not practiced. The amount of money expended on account of smallpox in a year would furnish vaccine virus sufficient to vaccinate 47,245 persons.

The time has arrived for the question of the prevention of smallpox to be put squarely up to the people, who in vaccination have a rapid and sure method of protecting themselves.

As in other places, the observation is repeatedly made that the foreign-born adult population who have been adequately vaccinated

CHART 3.—TYPHOID FEVER. DEATH RATES PER 100,000, 1904–1915.

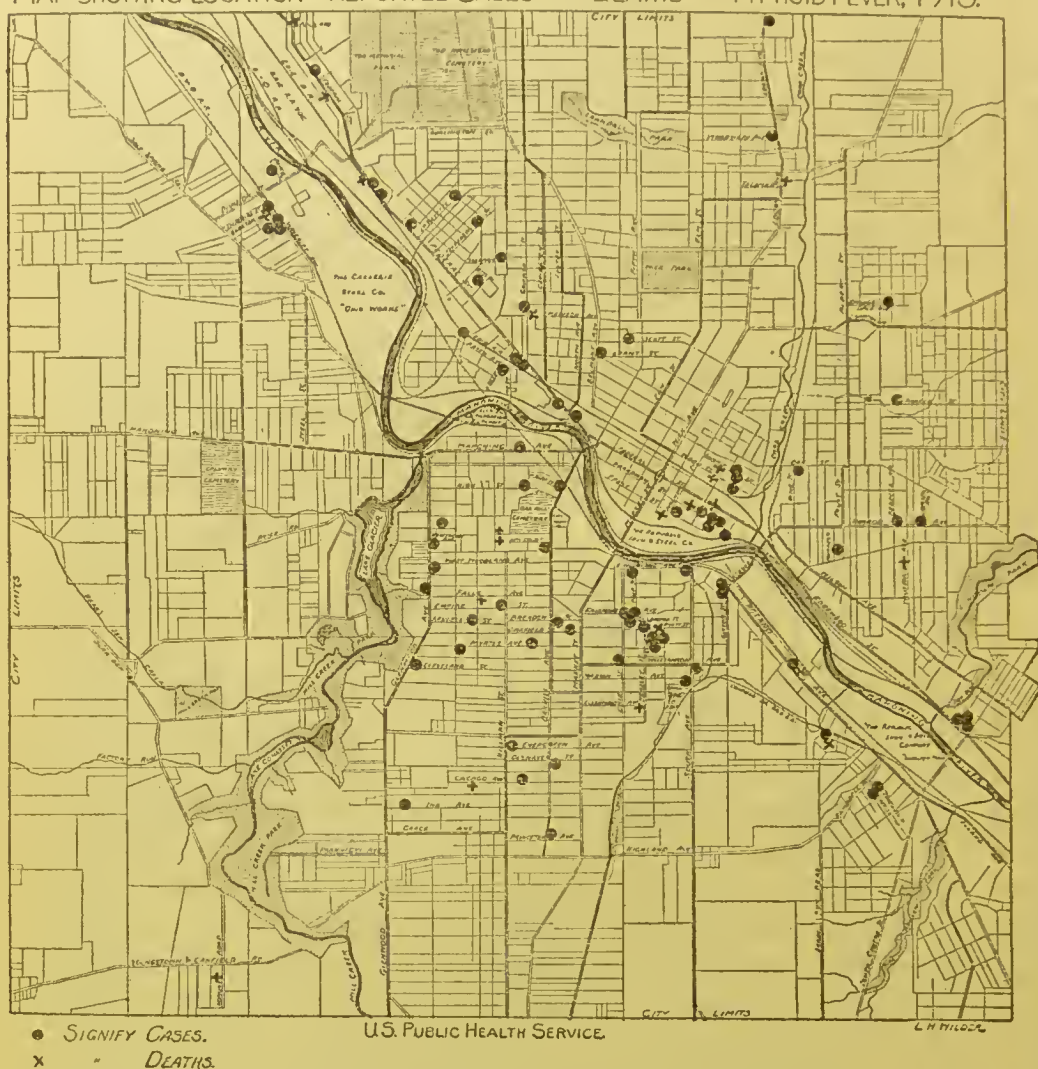


U.S. PUBLIC HEALTH SERVICE.

in the old country do not contract smallpox. The disease is prevalent among the native-born unvaccinated population only.

The quarantine of contacts is expensive, antiquated, and inefficient. The expenses involved and necessitated by a failure on the part of the ignorant or misinformed to avail themselves of the only sure means of protection, vaccination, must be borne to a large extent by those

CITY OF YOUNGSTOWN, OHIO.
MAP SHOWING LOCATION OF REPORTED CASES OF AND DEATHS FROM TYPHOID FEVER, 1915.



intelligent citizens who respect the rights of their neighbors and who therefore protect themselves by vaccination.

It is quite proper for the health officials in dealing with smallpox to limit their preventive measures to the isolation of the patient in an isolation hospital and to the vaccination of contacts, as well as all citizens, including the pupils of the public and parochial schools. The regulations requiring the vaccination of school children are excellent and should be enforced, and in their application the health department should receive the whole-hearted cooperation of the school authorities.

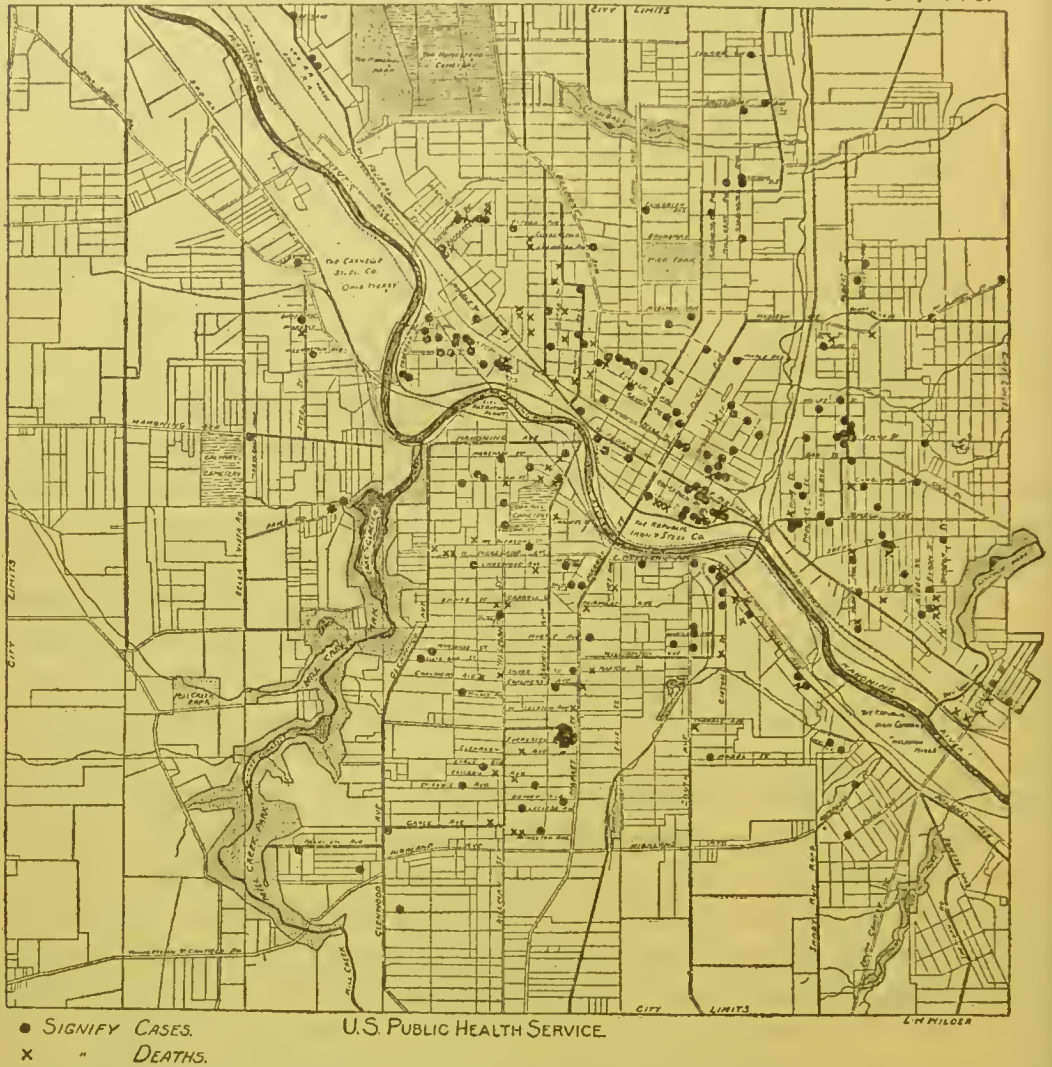
Isolation hospital.—The isolation hospital which the city owned was condemned and demolished. The appearance of smallpox during 1915 necessitated some means of isolation. A temporary hospital was therefore erected on the site of the old hospital. The temporary hospital consists of two small buildings, one of new construction and one a portable schoolhouse. In the former there are two wards heated by a hot-air furnace. This building will accommodate about 18 patients. In the latter building there are a kitchen and two rooms, one for an attendant and one for a nurse. The hospital is furnished with gas, electricity, and water, but no modern toilet facilities are available at present. The cost of this building, including the installation of the lighting and heating system, was \$1,759.17. Smallpox only is isolated in this hospital.

Tuberculosis.—During 1915, 275 cases of tuberculosis, with 80 deaths, were reported to the health department. This gives a mortality of 29 per cent and indicates that many cases of the disease were not notified. The death rate per 100,000 was 76.5. The activities carried on against the disease by either public or private agencies are very superficial and inadequate. The establishment of a corps of nurses in the health department, as well as the appointment of an epidemiologist, would enable the board of health to carry on some very excellent antituberculosis work, as well as other activities that would produce prompt results in the prevention of disease.

The tuberculosis sanatorium.—There was completed about a year ago a hospital which will accommodate approximately 100 patients and cost between \$2,500 and \$3,000 a bed. This hospital was built jointly by five counties, in which are included the cities of Youngstown, Akron, and Canton, in addition to a number of more or less important but less populous communities. The hospital is located 55 miles from Youngstown and near Akron. A hospital not larger than 100 beds is obviously too small to meet the needs of the territory comprised in the five counties. It is in fact too small to isolate the tuberculous of either Youngstown or Akron. It is located too far from Youngstown to be of great benefit to that city. When one considers that there were 80 deaths from tuberculosis during 1915 and at least 80 open cases, which will terminate during 1916, and that Youngstown has a population of over 100,000, it may be emphatically stated that the city is large enough to warrant the construction of a tuberculosis sanatorium for its own people. It would therefore be wise for the city of Youngstown and the county of Mahoning to make an effort to turn their interests in the five-county hospital over to the other counties, or, for that matter, to the city of Akron alone, with the view that at some future time Youngstown, with the assistance of the county, will own and maintain its own institution for the isolation of tuberculosis.

In addition to the above institution, the county of Mahoning owns an isolation hospital which is built on the grounds of the county infirmary and will accommodate some 14 patients. It is located 10 miles from Youngstown. When the five-county sanatorium was opened the county isolation hospital was closed. It would certainly seem advisable, until the county and city can own a larger institution,

CITY OF YOUNGSTOWN, OHIO.
MAP SHOWING LOCATION OF REPORTED CASES OF AND DEATHS FROM TUBERCULOSIS, 1915.



that this county hospital be opened as an isolation hospital to be used for the communicable diseases and especially for advanced cases of tuberculosis which will not stand transportation to any distance. Thus the afflicted will be given a place in which to spend their remaining days near friends and relatives. This point is an important one to consider before deciding upon a site on which to construct a tuberculosis sanatorium.

Some advanced cases are now being sent by the county to a make-shift hospital, which is really nothing more than a shack and should

be condemned and demolished. It is located within the city in a district where much insanitary property is in evidence.

Pneumonia.—During 1915 236 deaths from pneumonia were reported to the health department, making a death rate per 100,000 of 225.8. Many of the deaths ascribed to pneumonia occurred in children under 1 year of age, this figure representing 22.69 per cent of the total deaths under 1 year.

Diarrhea and enteritis.—Next to pneumonia the high death rate was in the case of diarrhea and enteritis, amounting to 114.8 per 100,000. There were 120 deaths ascribed to this condition, 92 of which were in children under 1 year of age. This figure represents 24.27 per cent of the total deaths under 1 year. Pneumonia and diarrhea and enteritis, together with premature birth and the condition reported as congenital debility, were the principal registered causes of the high infant mortality in the city of Youngstown. All can be classed as controllable. Active work along the lines of child welfare carried on by the corps of nurses mentioned above would undoubtedly result in the saving of many lives and a marked reduction in the death rate of the city.

Discussion.—It has already been pointed out that there are lacking in the health department those employees who are most directly concerned in the prevention of disease, an epidemiologist and public health nurses. In all of the important communicable diseases a careful epidemiological study should be made so that the source of the disease may be determined and preventive measures applied. It is then necessary to follow up by daily visits every case investigated that preventive measures may be adequately taken during the course of the disease and its spread prevented. The former duties are carried on by the epidemiologist, the latter by the public health nurses.

In addition to the epidemiological study, the epidemiologist should be required to render professional services at child-welfare stations and antituberculosis dispensaries, both of which should be opened by the health department without delay. The work contemplated would require the full-time services of a physician familiar with public health work. He should have under him the public health nurses, not less than 16 in number, and the general administrative control of the diagnostic laboratory. There would then be a force adequate to handle the public health question from the modern standpoint of a supervision over the individual harboring the infection as well as a force of sanitary inspectors to exercise a supervision over the environment.

According to modern views the great danger in the spread of disease lies in the individual who is sick with that disease or who is a carrier of the causative organism. Therefore, the logical thing to do in order to prevent the spread of the disease is to isolate the patient. To do

Tabulation of regulations for the control of the common communicable diseases, Youngstown, Ohio.

| Disease. | Period of isolation (patient). | Period of quarantine (contacts). | Circulars of information. | Terminal fumigation. | Treatment of bread-winners. | Exclusion from school and public gatherings. | To be reported by physicians. | To be placarded. | School and public library notified. | Sale of foods prohibited. |
|--------------------|--|--|---------------------------|----------------------|---|--|-------------------------------|------------------|-------------------------------------|---------------------------|
| Diphtheria..... | Until 2 negative cultures taken 48 hours apart are obtained and not less than 14 days. | Until termination of isolation and 1 negative culture. | None.... | Yes..... | May be permitted to carry on vocation. ¹ | Yes; patient and contacts. | Yes..... | Yes..... | Yes..... | Yes. ² |
| Scarlet fever..... | Until disappearance of desquamation. | Until termination of isolation. | None.... | Yes..... | Same..... | Same..... | Yes..... | Yes..... | Yes..... | Yes. ² |
| Measles..... | Until 10 days after placarding. | Until termination of isolation (nonimmune children only). | None.... | No..... | No restriction on adult members of household. | Yes; except those who have had measles. | Yes..... | Yes..... | No..... | No. |
| Smallpox..... | Until disappearance of all scales. | Until termination of isolation, after which observation for 14 days. | None.... | Yes..... | May be released after vaccination. | Yes; patient and contacts. | Yes..... | Yes..... | Yes..... | Yes. |
| Chicken-pox..... | None ⁴ | None..... | None.... | No..... | No restriction..... | Yes; patient only. | Yes..... | Yes..... | No..... | No. |
| Whooping cough.. | Yes; until through whooping. |do..... | None.... | No..... | Same..... |do..... | Yes..... | Yes..... | No..... | No. |
| Typhoid fever..... | ..... | ..... | Yes.... | Yes..... | ..... | ..... | Yes..... | ..... | ..... | Yes. ³ |
| Tuberculosis..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

¹ Except when vocation brings him in contact with children or general public.² Some one not in contact with patient and with negative culture permitted to carry on the business.³ No one coming in contact with patient allowed to handle food products.⁴ Most cases, especially in adults, examined to exclude smallpox.

this the city is badly in need of a permanent isolation hospital. Such a hospital should be located within easy access. If possible it would be wise to erect it on the grounds already occupied by one of the hospitals of the city, placing it under the general management of that hospital. This is a scheme which has worked out elsewhere satisfactorily.

In addition to an isolation hospital for such diseases as diphtheria and scarlet fever, there should also be provided a sanatorium in which to isolate open cases of tuberculosis found in the city of Youngstown. Such a hospital might be erected with the assistance of the county, or it could be a part of the isolation hospital to be used for other communicable diseases. It is safe to say that a combined hospital of this kind should have not less than 200 beds, 150 for tuberculosis cases and 50 for other communicable diseases. The present temporary hospital could still be utilized for the isolation of smallpox, but as has already been pointed out, if an adequate amount of vaccination is performed there should be no need for a place in which to isolate smallpox.

Diagnostic Laboratory.

The diagnostic laboratory of the city board of health has been in existence some 17 years, although it is only in recent years that it has received adequate recognition from the legislative body. At present it is housed in a well-lighted room in the city hall in connection with the offices of the board of health and is well equipped to do any work that may be required of it.

The laboratory is in charge of a bacteriologist, who is also the secretary or clerk of the board of health as well as the chemist and the local registrar.

The routine work carried on in the laboratory consists of the examination of cultures for diphtheria, the examination of sputum for tuberculosis, and in the case of typhoid fever, of blood for the Widal reaction or blood cultures for the causative organism. In addition, daily examinations are made of the city water supply, and milk samples collected by the milk inspector are examined for visible dirt, specific gravity, and butter fat.

Method of procedure.—The laboratory issues to physicians free of charge specimen outfits for the submission of material to be examined for diphtheria, tuberculosis, and typhoid fever. In the case of diphtheria, two test tubes, each containing a sterile swab, are furnished, one swab to be used for taking specimens from the throat and one for taking specimens from the nose. Loeffler's blood serum is inoculated from the swab, incubated at 35° C. for 18 hours and smears, then treated by Kinyon's modification of Ponder's stain.

In the case of tuberculosis, wide-mouthed bottles containing a small amount of carbolic acid solution are furnished. Material is stained in the usual way.

To transmit blood to be tested for the Widal reaction, an aluminium foil is furnished, or for blood cultures, a test tube containing oxbile. The latter is corked and sealed with paraffin.

The specimens of water submitted twice daily by the superintendent in charge of the city water works are three in number, one a sample of the raw water, one the water after sedimentation, and one after filtration. Bacterial counts on agar at 20° C. are made from each sample as well as a determination as to the presence of the colon bacillus. The latter is accomplished by planting in lactose bile fermentation tubes. Of the raw water $\frac{1}{2}$ c. c. is used, experience having shown that the colon bacillus may usually be found in that amount. Of the filtered water samples, 1 and 10 c. c. are planted. Tubes showing gas are planted on neutral red-lactose-bile-agar and incubated. Colonlike colonies are then tested in lactose, dulcitol, and saccharose broths and also for indol.

In the case of milk, bacterial counts are not made. The routine examination consists of filtration through a cotton disk to determine the presence of visible dirt, the use of the lactometer to determine the amount of solids, and the Babcock test to determine the amount of fat.

The cost of operating the laboratory during the year 1915 amounted to \$2,075.70, including the salary of the bacteriologist. There were made during the same period 5,092 examinations, making a cost per examination of 40 $\frac{2}{3}$ cents.

Tabulation of examinations made in the laboratory, calendar year 1915.

| | Positive. | Negative. | Total | | Positive. | Negative. | Total. |
|---------------------|-----------|-----------|-------|-----------------|-----------|-----------|--------|
| Typhoid fever: | | | | Milk..... | | | 1,673 |
| Blood cultures..... | 8 | 29 | 37 | Cream..... | | | 15 |
| Widal tests..... | 5 | 34 | 39 | Water: | | | |
| Tuberculosis..... | 161 | 379 | 540 | Well..... | | | 53 |
| Diphtheria: | | | | City water..... | | | 1,680 |
| For diagnosis.... | 72 | 391 | 463 | Total..... | | | 5,092 |
| For release..... | 95 | 497 | 592 | | | | |

MUNICIPAL ENGINEERING ACTIVITIES.

The Water Supply.

The municipal water supply is taken from the Mahoning River within the city limits, above the outlet of all municipal sewers. This river receives pollution along its entire course, but more especially from the larger municipalities of Warren, Niles, and Girard. In addition great quantities of industrial waste are cast into it from the various iron and steel industries along its banks. The water therefore contains a large amount of suspended matter, both organic and inorganic in composition.

The water furnished to the city is first purified by means of mechanical filtration.

There are two sedimentation basins with a capacity of 4,000,000 gallons each. During 1915 both alum and copper sulphate were used

in the process of purification, the former in amounts averaging 2.35 grains per gallon and the latter in amounts averaging 1 part per million. The addition of copper sulphate not only eliminated the growth of algæ which were becoming objectionable, but also seemed to have a marked beneficial influence on the purity of the filtered water. Since the rise in price of copper sulphate its use has been discontinued and alum alone used. This coagulant is mixed in tanks, from which it passes into a well. From here it is sucked by the action of the pumps directly into the pipes conducting the raw water to the sedimentation basins. Upon entering a basin the flow of water is directed back and forth by two baffle walls to a final compartment which it enters from below. Having traversed this compartment it passes over a weir into the pipe leading to the filter beds.

The filter beds are 28 in number, 16 of them in use and 12 in the process of construction. Each of the former is capable of furnishing approximately 850,000 gallons of water and each of the latter is designed to furnish 1,000,000 gallons of water per day. The filter material is composed of three layers of gravel in different sizes and 3 feet of sand. The filters are washed from below by filtered water, agitation being produced by compressed air.

No chlorine treatment is used. About $2\frac{1}{2}$ per cent of the filtered water is required as wash water. Approximately 10,000,000, or 95 gallons per capita, are furnished to the city daily.

Water is supplied to the low-lying portions of the city by direct pressure from centrifugal pumps, while in those parts of the city with higher elevation, pressure is maintained by means of standpipes.

The entire plant is modern both in construction and operation. Work is now in progress to improve certain of the details relative to preliminary treatment.

During 1914 there was but one month, October, in which the average percentage of efficiency of the filters was below 97. During this year of efficient service the maximum number of deaths from typhoid fever in any fall month was three in September. In the year 1915, during the same period there was an increase in the number of deaths from typhoid, there having occurred four in September and five in October. During May, June, and July the filters did not operate to the degree of efficiency to be desired and colon bacilli were present in 10 c. c. samples for an unusual number of days in each month from May until November. This condition usually occurs after heavy rains. While it is thought that the city water plays no part in the spread of typhoid, yet it would seem wise to take some additional safeguards by installing a chlorine plant to be used only when filtration alone does not produce the desired results.

It would also seem advisable to provide adequate methods for disposal of industrial waste products above the intake of the water supply. Such products are now passed into the river untreated.

There are still in use in the city a number of wells of varying depths. The shallow wells at least should be abolished where city water is available.

There is at present a dam under construction in the Mahoning River and located 37 miles above Youngstown, which will impound 10,000,000,000 gallons of water. This will furnish the city at times of low water a reserved supply for both domestic and industrial purposes.

The following tables give in some detail the results of the analysis of water supplied to the city for domestic purposes.

Tabulation of results of the examination of 560 samples of the city water supply, calendar year 1915.

| | $\frac{1}{2}$ c. c. | | 1 c. c. | | 10 c. c. | | Number of days present in 1 c. c. or less. | Number of days absent in 1 c. c. or less. | Number of days present in 10 c. c. | Number of days absent in 10 c. c. |
|------------|---------------------|---|---------|----|----------|----|--|---|------------------------------------|-----------------------------------|
| | + | - | + | - | + | - | | | | |
| January: | | | | | | | | | | |
| Raw | 43 | 1 | | | | | 24 | 0 | | |
| Settled | | | 12 | 32 | | | 12 | 12 | | |
| Filtered | | | 1 | 43 | 3 | 41 | 1 | 23 | 3 | 21 |
| February: | | | | | | | | | | |
| Raw | 42 | 1 | | | | | 24 | 0 | | |
| Settled | | | 14 | 29 | | | 11 | 13 | | |
| Filtered | | | 0 | 43 | 0 | 43 | 0 | 24 | 0 | 24 |
| March: | | | | | | | | | | |
| Raw | 49 | 1 | | | | | 27 | 0 | | |
| Settled | | | 5 | 45 | | | 5 | 22 | | |
| Filtered | | | 0 | 50 | 0 | 50 | 0 | 27 | 0 | 27 |
| April: | | | | | | | | | | |
| Raw | 48 | 0 | | | | | 26 | 0 | | |
| Settled | | | 35 | 13 | | | 11 | 15 | | |
| Filtered | | | 2 | 46 | 3 | 45 | 1 | 25 | 2 | 24 |
| May: | | | | | | | | | | |
| Raw | 46 | 0 | | | | | 26 | 0 | | |
| Settled | | | 23 | 23 | | | 20 | 6 | | |
| Filtered | | | 2 | 44 | 7 | 39 | 2 | 24 | 4 | 22 |
| June: | | | | | | | | | | |
| Raw | 47 | 1 | | | | | 26 | 0 | | |
| Settled | | | 26 | 22 | | | 20 | 6 | | |
| Filtered | | | 3 | 45 | 18 | 30 | 3 | 23 | 10 | 16 |
| July: | | | | | | | | | | |
| Raw | 48 | 0 | | | | | 27 | 0 | | |
| Settled | | | 35 | 13 | | | 22 | 5 | | |
| Filtered | | | 10 | 38 | 24 | 24 | 8 | 19 | 14 | 13 |
| August: | | | | | | | | | | |
| Raw | 47 | 1 | | | | | 26 | 0 | | |
| Settled | | | 24 | 24 | | | 18 | 8 | | |
| Filtered | | | 4 | 44 | 11 | 37 | 4 | 22 | 7 | 19 |
| September: | | | | | | | | | | |
| Raw | 45 | 2 | | | | | 26 | 0 | | |
| Settled | | | 14 | 33 | | | 10 | 16 | | |
| Filtered | | | 1 | 46 | 8 | 39 | 1 | 25 | 6 | 20 |
| October: | | | | | | | | | | |
| Raw | 43 | 2 | | | | | 25 | 0 | | |
| Settled | | | 18 | 27 | | | 14 | 11 | | |
| Filtered | | | 1 | 44 | 9 | 36 | 1 | 24 | 7 | 18 |
| November: | | | | | | | | | | |
| Raw | 42 | 3 | | | | | 25 | 2 | | |
| Settled | | | 7 | 38 | | | 6 | 21 | | |
| Filtered | | | 0 | 45 | 8 | 37 | 0 | 27 | 6 | 21 |
| December: | | | | | | | | | | |
| Raw | 48 | 0 | | | | | 27 | 0 | | |
| Settled | | | 5 | 43 | | | 6 | 21 | | |
| Filtered | | | 0 | 48 | 1 | 47 | 0 | 27 | 1 | 26 |

NOTE.—A day free from colon bacilli means a day during which no colon bacilli were found in either of the daily samples examined.

| | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| Raw water..... | 1,323 | 740 | 572 | 1,175 | 201 | 213 | 240 | 298 | 247 | 414 | 635 | 2,631 |
| Settled water..... | 40 | 17 | 11 | 155 | 27 | 30 | 36 | 57 | 11 | 19 | 11 | 24 |
| Filtered water..... | 2 | 1 | 2 | 54 | 37 | 89 | 16 | 23 | 3 | 3 | 2 | 3 |
| Percentage of efficiency.... | 98.38 | 99.77 | 99.33 | 94.80 | 89.41 | 76.32 | 80.56 | 94.0 | 97.71 | 99.08 | 99.20 | 99.79 |

The Disposal of Sewage.

Sewage is passed into the Mahoning River untreated. Located between the intake of the water supply and the highest sewer outlet is a dam.

There are few districts in the more populated sections of the city where sewers are not available. In one there are no sewers at all. Here it was planned to lay the necessary pipes and secure the necessary grade for the main by carrying it through one of the city parks to the river. For some reason, which is not apparent, the plan was opposed and work has, therefore, not commenced. This sewer should be laid without further delay. In two other sections of the city the sewers are laid, but as yet they have not been provided with outlets; therefore, houses in those sections have not been able to connect. There are in the city at present 141 miles of sewers, main and lateral.

The method of connecting to the sewer through the medium of a catch basin as practiced in Toledo is not permitted in this city.

Plumbing.—The inspection of plumbing comes within the jurisdiction of the health department. The work of the plumbing inspectors is closely associated with that of the building department of the city and, therefore, the inspectors of plumbing occupy offices in common with that department. It is suggested that it would be advisable to transfer the division of plumbing inspection to the building department.

The plumbing code is patterned after the State law, but has been simplified wherever possible and consistent with safety. It is therefore practicable to install a simpler system of plumbing than is permitted in some other places.

Every action which tends toward simplicity in the plumbing code and reduction in the expense of installing plumbing is to be encouraged and commended.

The Collection of Garbage and Rubbish.

The collection and disposal of garbage.—The collection of garbage is done by contract under the supervision of the city board of health. This board, out of money appropriated for the purpose, pays \$2.25 for every ton collected. The amount expended in this way amounted in 1915 to \$22,514.99 and represents the collection of 10,006 $\frac{2}{3}$ tons of garbage, or approximately 27 $\frac{1}{2}$ tons per day. The garbage is collected in iron, end-dump wagons, with a capacity of approximately two tons. The regulations require that these wagons be kept covered by a canvas cover. To facilitate collections the city is divided into seven districts—a business and six residential districts. From the former, garbage is collected daily in summer and four times a week in winter. From each of the residential districts, collections are made twice a week in summer and once a week in winter. The garbage is taken to a central station where it is weighed by an employee of the

health department and then loaded into cars and transported to the reduction plant. The cost of transportation and reduction is borne by the department of service of the city, which pays the reduction plant 45 cents for every ton reduced. The reduction plant is privately owned. In the process of disposal the garbage is first dried. It is then treated with gasoline to extract the fats, after which it is dried again, ground and used as an ingredient for the manufacture of fertilizer. The offensive gases are given off during the first drying process. They are passed through washers before discharge through the chimney. In connection with this plant for garbage reduction, there are likewise retorts for handling dead horses or other large animals.

The collection and disposal of rubbish.—The city has little or nothing to do with the collection of rubbish. It is carted away according to the whims of the householder and at his expense. The city, however, does maintain an incinerator for the destruction of rubbish. This incinerator was built in 1898 for the cremation of garbage, but is now out of date and too small to be used for that purpose. Small dead animals are collected at the rate of 50 cents for a dog and 25 cents for a cat by anyone who will undertake the job. They are burned at the incinerator with the rubbish. It cost the city \$264.25 during 1915 to collect small animals.

Discussion.—It is thought that it would be desirable to have the city operate its own system for the collection of garbage. This change could be made when the present contract has expired. At the same time a system of rubbish collection should be inaugurated. These two classes of refuse may be collected without a duplication of equipment as the same wagons may be utilized to haul garbage and rubbish alternately.

After the first expense involved in acquiring equipment it is believed that the city can collect its own garbage at a figure lower than it is now paying under contract and at the same time have on hand the machinery with which to collect other city waste. This plan should be considered before another garbage contract is let.

In this connection it might be pointed out that during 1914 the city of Toledo collected garbage and delivered it to the reduction plant at approximately \$2.10 per ton. The privately owned reduction plant charged the city 22½ cents per ton for disposal.

It is not at all unlikely that the amount of garbage collected in Youngstown during 1915 does not represent the total amount of garbage produced by the city. Estimating the amount at one-half a ton per 1,000 inhabitants there should be approximately 50 tons per day, as against an average of 27½ tons actually collected. It can be said with certainty that there is quite a lot of garbage mixed with rubbish and which is therefore not collected as garbage. This

together with the garbage produced in the outlying rural sections of the city might account for the discrepancy.

It should also be pointed out that rubbish, provided it contains no garbage, is valuable as a fill to reclaim low-lying areas of the city. Thus land is made valuable which would be otherwise worthless. Such filling should be done under the supervision of a city employee, so that the method will not lead to any objectionable results. One must keep in mind that such fills, while they may be unsightly for the time being, are not insanitary.

PUBLIC HEALTH SOCIAL SERVICE.

Health Supervision of School Children.

The health supervision of school children is carried on by the educational authorities under the direction of the health officer.

There are engaged in the work four medical inspectors who receive \$10 a day for 20 days at the beginning of the school year, in which time they are expected to complete their duties. There are also engaged in the work two specialists on the eye, ear, nose, and throat, who furnish treatment without remuneration to children referred to them. Four nurses at \$80 per month are engaged during the school year only.

Methods of procedure.—Children in high and parochial schools are not examined.

Each child is given a card which follows it throughout its school life. On this card is noted any defect as well as the result of treatment. Where treatment is necessary notification blanks in duplicate are made out, one of which is sent to the family and one given to the nurse, whose duty it is to follow up the case. Where the patients are unable to pay for medical services they are either referred to one of the two specialists mentioned above and treated at the free dispensary of the Youngstown hospital, or given a card of admission to one of the hospitals, if hospital treatment is necessary. Throughout the entire school year nurses are required to visit schools daily for the purpose of detecting beginning communicable diseases or other conditions requiring attention, to follow up cases as they may think necessary, to visit the homes of children reported absent by the principal and by talks or otherwise to instruct the pupil in personal hygiene. In their work they cooperate with the health department as well as the truant officer.

No dental clinic has been established, but inspection by both physicians and nurses is made to include the teeth and some dental work is performed by the dentists of the city free of charge.

Medical clinics are frequently held in the school, to which parents and family physicians are invited. At these clinics the child is thoroughly examined by the four medical inspectors, and defects are

pointed out to the parents, together with the necessity for treatment. The object is in large measure an educational one.

There has been inaugurated in some of the schools the pupil health officer and pupil nurse system, whereby the boy and girl appearing neatest during the week are appointed health officer and nurse, respectively, for duty during the coming week. This is said to be a great incentive to improvement in matters of personal hygiene.

The toothbrush drill is also required and each pupil made to own a toothbrush.

The educational authorities will furnish glasses free of charge to worthy cases.

During 1915 the medical inspectors inspected 13,166 pupils. Only those pupils are given a thorough examination who, in the opinion of the inspectors, require it. Much is left to the discretion of the inspectors. There were found 7,895 defects, of which 2,273 were corrected. The nurses made 1,694 visits to the homes.

The Visiting Nurses' Association.

The visiting nurses' association is supported by private philanthropy. There were employed during 1915 10 nurses, and there was available to defray the expenses of the organization during the same period the sum of \$10,000. There have recently been added 3 additional nurses to the corps on account of the child-welfare work, which will be carried on through the summer months of the present year.

The nurses visit the indigent sick who are in need of nursing services. Their duties include assistance rendered to those suffering from communicable diseases such as tuberculosis, typhoid fever, measles, and scarlet fever, as well as activities along the lines of child-welfare and prenatal care. The work is also of an educational nature, as instruction is given, by word and practice, along the lines of preventive medicine. It may be said, in fact, that many of the duties of these nurses are distinctly of a public-health nature and performed for the benefit of the public health.

Child-Welfare Work.

Except for the work performed by the visiting nurses' association as part of its routine, there has been no special activity carried on to prevent the unnecessary deaths among infants causing the high infant mortality rate of 157.1. Recently there has been raised through private charity \$1,500 for work of this kind to be performed during the summer months of the present year. This work will be done through the agency of the visiting nurses' association, who have added for the purpose three extra nurses to their corps. Infant-welfare stations will be opened in several parts of the city.

Antituberculosis Activities.

Where active field work is performed along the lines of the prevention of tuberculosis it is done by the visiting nurses' association. There is a society, however, which raises a small amount from the sale of Red Cross seals. This money is spent in furnishing supplies to those who are worthy and who are afflicted with tuberculosis. A certain amount of this money is also used to defray the expense of maintaining a very limited number of beds in the tuberculosis sanatorium. No antituberculosis dispensaries are operated.

The work performed by the health department toward preventing tuberculosis and the tuberculosis sanatorium have already been mentioned (pp. 2662-2663).

Discussion.

It is generally agreed that a corps of public health nurses is the most important part of any health department. The work that they perform should be productive of the best results. There is hardly a field in the whole science of preventive medicine in which their services can not be employed to advantage. It is therefore most essential that the health department have a corps of such employees at its command. The number should not be less than 16. The city should then be divided into 16 districts and a nurse placed in each district. The poorest and most thickly populated sections of the city should be divided into the smallest districts. Each nurse should then perform within her district all the duties required of a public health nurse. At the present time it is quite impossible for the city, for financial reasons, to employ and pay 16 nurses, but it is quite possible by a combination of the nursing forces now employed by other bodies to attain the same results, for the time being at least.

According to modern views, it is in the interest of efficiency and economy to combine all the forces employed in public health work and place them under one controlling head. It would, therefore, seem advisable to combine the nurses of the Visiting Nurses' Association and the school nurses engaged by the board of education and to enlarge the force by the addition of four nurses to be employed by the board of health. A combination like this would make available 21 nurses. Reserving five for general nursing, or what might be strictly spoken of as charitable work, there would remain 16 nurses to carry on the necessary public health activities. The latter would be engaged in prenatal and infant welfare work, school nursing, and duties in connection with the control of the communicable diseases.

As much of the work of these nurses would be carried on at the homes of industrial workers, who represent a large part of the population, it might be possible to enlist the cooperation of the large

steel industries, so that they would be willing to employ some additional nurses, thus adding to the force and making it possible to reduce the size of the districts.

It is unfortunate that the city government is not in a position to pay the salaries of an adequate corps of nurses. The work that they perform, as contemplated herein, is strictly speaking public health work and, therefore, a legitimate governmental function.

FOOD INSPECTION.

Food inspection as carried on by the health department of Youngstown will be taken up under the following headings:

The control of the milk supply.

The inspection of meats and other foods.

The Control of the Milk Supply.

The control of the milk supply of communities in Ohio is placed by statute in the hands of the local boards of health. State law also makes provisions for the maintenance of the purity of milk. In addition the board of health of Youngstown has promulgated regulations setting a standard for the purity of milk and requiring that certain precautions be taken in its production and sale.

Requirements of regulations.—All places where milk is sold or handled must be licensed by the board of health. Before such license is issued the place must be inspected by the dairy inspector.

No milk is allowed to be sold in the city unless it has come from cows which have been tuberculin tested and shown to be free from tuberculosis. Any person selling milk from untested cows will have his permit revoked.

No person is permitted to bring into the city for sale or delivery or to offer for sale any milk—

1. That contains more than 88 per cent of water or fluids, less than 12 per cent total solids, or less than 3 per cent of butter fats.
2. That has had any part of the cream removed.
3. That has a specific gravity of less than 1029.
4. That contains any foreign chemical.
5. That contains pathogenic bacteria.
6. That contains more than 500,000 bacteria per cubic centimeters.
7. That is drawn from a cow having a communicable disease, or a cow from a herd having or exposed to any communicable disease.
8. That is drawn from a cow 15 days before or after parturition.
9. That is drawn from a cow fed on garbage, distillery waste, or other improper food.
10. That has a temperature or has been kept at a temperature above 65° F.
11. That has not been kept under conditions required by the regulations.

The first three provisions do not apply to milk sold under the name of skimmed milk.

For laboratory purposes the standard for the cleanliness of milk is based on a determination of the visible dirt present in one-half pint after filtering through a cotton disk from three-fourths to 1 inch in diameter. By this standard "clean milk" is milk that does not leave more than 6 particles of dirt nor tint or color the cotton except with

fat. From this there are three gradually lowering standards comprising "fairly clean milk," "dirty milk," and "filthy milk." The two latter grades may not be sold or brought into the city.

Vehicles from which skimmed milk is sold must be distinctly labeled in letters not less than 1 inch in height with the words "skimmed milk," or if the milk is not sold from a vehicle each vessel must be so labeled as to show that it contains skimmed milk. Skimmed milk must contain at least 9 per cent milk solids. No person is permitted to sell milk in quantities less than 1 gallon, except in sanitary bottles suitably capped, unless the milk is sold from a milk house or dairy, when it may be dipped. The milk house must not be located less than 15 feet from a privy vault or cesspool.

In addition to the above the regulations provide for the location of storage plants for milk, the cleanliness of wagons, the labeling of wagons, the covering of wagons, the bottling of milk, the removal of employees from houses containing communicable diseases, the sealing of containers, taking samples, etc.

Dairies are required to be scored, the score card providing for the condition of the cow, the stable, the water supply, the milk house, the health of attendants, and the cleanliness of milking. Scores are made on the basis of 1,000 points.

Methods of procedure.—There is but one man engaged in the supervision of the milk supply. He is required to inspect and score producing farms, to exercise a general control over pasteurizing plants and places selling milk and to collect samples for analysis. In addition he is required to inspect perishable foods offered for sale.

Samples of milk are collected in the early morning, and are taken with as little delay as possible to the laboratory of the health department. Here they are subjected to three tests, the lactometer test to determine the amount of solids, the sediment test to determine the amount of visible dirt, and the Babcock test to determine the amount of butter fat. The laboratory standard for clean milk is based on the amount of visible dirt. This test alone does not seem to be adequate, but in connection with the bacterial count the information obtained by this means would be of value.

The inspector determines the temperature of the milk while on the wagons, and if it is below the standard (65°) it is returned to the producer.

During this survey an inspection was made of a number of the producing farms, and while a few might be classed as good, many were far from satisfactory. All had the milk house separate from the barn and all were cooling milk by one means or another, some in a very primitive way. A few use ice in the process of cooling, and a very few ice the bottles while delivering to the consumer. Generally speaking, barns were poorly ventilated and dirty, although occasionally one was found to be in excellent condition. Allowance must be made because of the time of year, the farmers being more interested in planting their crops than in maintaining the sanitary condition of their barns. To a large extent the business of dairying is carried on merely as a side issue to agricultural pursuits.

Inspections were also made of the pasteurizing plants. The methods of pasteurization differ widely, some using the "holding" and some the "flash" system. One plant pasteurizes in the bottle. Many of the plants are too small for the purpose, sanitary conditions are not maintained as they should be, and the technique of the operation is poor. Necessarily the time and temperature of pasteurization vary greatly and no plant is supplied with a thermoregulator or temperature recorder.

A provision of the regulations requires that milk sold in quantities less than 1 gallon must be bottled at the dairy. Therefore, all milk which is not pasteurized is bottled at the producing farm, either by machine or by hand. Capping is also accomplished mostly by hand.

Discussion.—The investigation of the milk supply shows conclusively that it is absolutely impossible for one man to properly handle the situation and that it is essential that a thorough study, both in the field and in the laboratory, be made of the different processes in use in the production of Youngstown's milk supply. This will mean the addition of at least one milk inspector, making one for dairy inspection and one for city milk inspection. A thorough study should be made of the operations of each pasteurizing plant. Samples should be collected from the farms producing the milk, from the plant before the milk goes into the pasteurizer and after it is pasteurized and from the bottle as delivered to the consumer.

These samples should be examined for bacterial content. It is doubtful whether some of the pasteurizing plants are getting the results to be expected from pasteurization. After a careful study has been made it will probably be found necessary to require each plant to use the "holding" method and pasteurize at a temperature of 145° for not less than 25 minutes. The installation of a thermoregulator and a temperature recorder at each plant should be compulsory. It would then be as well to require the pasteurization of all milk sold in the city of Youngstown, except only milk produced under the standard set for certified milk. Certified milk is now sold in Youngstown from a farm producing certified milk for the Allegheny County Medical Society of Pennsylvania.

Tabulation of information relative to milk supply, city of Youngstown, Ohio.

| | |
|--|--------|
| Number of milk samples analyzed in laboratory, 1915..... | 1, 673 |
| Grade 1, "Clean milk"..... | 417 |
| Grade 2, "Fairly clean milk"..... | 840 |
| Grade 3, "Dirty milk"..... | 395 |
| Grade 4, "Filthy milk"..... | 21 |
| Butter fat above standard..... | 1, 569 |
| Butter fat below standard..... | 98 |
| Total solids above standard..... | 1, 177 |
| Total solids below standard..... | 496 |

| | |
|--|--------|
| Samples of cream examined, 1915..... | 15 |
| Number of producing farms..... | 862 |
| Number of pasteurizing plants..... | 17 |
| Pasteurizing by holding method in bulk..... | 10 |
| Pasteurizing by holding method in bottles..... | 1 |
| Pasteurizing by flash method..... | 6 |
| Daily consumption of milk..... gallons.. | 8, 820 |
| Daily consumption of cream (family use and ice cream).....do.... | 290 |
| Longest haul by wagon or truck.....miles.. | 15 |
| Longest haul by electric car.....do.... | 20 |
| Longest haul by train.....do.... | 50 |
| Percentage of milk supply pasteurized (estimated).....per cent.. | 90 |

Inspection of Meats and Other Foods.

Meats.—There are no slaughterhouses under Government supervision. The ante and post mortem inspection of animals in the local packing house is performed by an inspector of the health department. His entire time is taken up with this work and that of inspecting butcher shops. Some slaughtering on a small scale is done outside of the city limits. The meat is brought into the city for sale, but is not inspected, mainly on account of the difficulty in determining when and where it is to enter the city.

Other foods.—There is no organized food or restaurant inspection. The inspection of perishable foods, fruits and vegetables especially, is made by the milk inspector, who is also required to give such time as he may to the inspection of other places selling food or other food products. It is obvious that it is impossible for one man to carry on this work as well as the milk inspection.

An inspection of restaurants is also made a part of the routine work of the sanitary police. No scoring of any kind is done.

Except for milk, the laboratory does not perform any analyses to determine the quality of food products.

Discussion.—The health department should be provided with an inspector, whose duties would be chiefly concerned with the inspection of places selling foods as well as the products sold therein. These places would include restaurants, bakeries, stores, markets, and the like. Thus, with an inspector for this purpose, one meat and one sanitary inspector already employed, and an additional milk inspector, the city would have the minimum force with which to supervise the food supply from the public health standpoint.

All places handling food should be scored and the results published.

Regulations should be promulgated to maintain sanitary conditions and to prevent those suffering from communicable diseases from handling food.

All meat slaughtered outside of the city limits without inspection and brought into the city for sale should be taken to a central point, so that the city meat inspector might inspect it with facility.

THE SANITARY POLICE.

The sanitary police force is composed of six uniformed men, one of whom is the chief sanitary inspector. Their duties are mainly concerned with the abatement of nuisances and the placarding and fumigation of premises for communicable diseases.

The city is divided into five districts in order to facilitate the work.

Once a year a survey is made with reference to the sanitary condition of the different premises within the city. The results of the inspection are noted on blank forms, devised for the purpose, which include spaces to state the condition of the house, cellar, yard, and the character of toilet facilities. Where orders are issued to abate nuisances disclosed as a result of this survey reinspections are required.

Discussion.—The enforcement of the law requiring sewer connections, the fly proofing of privies, which for any reason may not be connected to the sewer, the elimination of shallow wells, the prevention of the accumulation of manure, the enforcement of the regulation requiring that all premises be furnished with a garbage tin and the enforcement of a housing code are the important duties of a sanitary inspector. Successful work along these lines alone would go far to improve the public health.

It is to be regretted that the inspectors can not devote their entire time to such duties. This, however, is impracticable because the average citizen has a false conception of the duties of a health department. He believes that pestilence arises from the collection of ashes or old bottles in the adjoining lot, sewer gas, a dead dog in the street, the neighbor's chicken yard, bad odors and the like, and therefore everything that offends the special senses is reported to the health officer as dangerous to health. It is in attending to such matters that the sanitary police are required to perform a great deal of work which has little or no bearing on the public health, and which is a reason why many health departments are devoting a greater part of their energies and appropriations to things that count for little or nothing in the prevention of disease and are unable to perform those duties which are of real importance. This unfortunate condition must be attributed largely to the various health departments, which have neglected to educate the people along the lines of modern thought in public health work. Many health departments of the present day are still using antiquated methods, and so long as the people think that everything unsightly must necessarily be insanitary, health departments are compelled to expend the bulk of their money in performing duties that do not concern the public health. Thus it is difficult to secure funds to make much-needed reforms.

Many of the complaints that now come to the health department should be made to the police department, and it should be the duty of that department to have such nuisances abated. In fact the modern view contemplates that each patrolman act as a sanitary inspector. This has been accomplished elsewhere without increasing the size of the police force and without interfering with the patrolman's usual duties.

It is thought that the chief and four sanitary police are sufficient for Youngstown and that one of the six should be transferred for milk inspection, thus giving the health department an additional milk inspector, who is badly needed.

THE HOUSING PROBLEM.

In the city of Youngstown the housing problem has become quite an extensive one because of the rapid growth of the city due to the expansion of the iron and steel industries in recent years. This has produced a large influx of foreigners to work in the mills. These people settle by races in different parts of the city, where facilities for taking care of numbers are poor. Overcrowding and insanitary conditions are therefore likely to occur. While the question requires more careful study than the writer was able to give, a few observations of a general nature were made. There are but few places that might be described as tenement houses and but few "flop" houses, but the boarding house is very common in the districts under consideration. Many of such houses are detached, so that there are windows on all sides and light and ventilation may therefore be obtained. Some, however, are built in rows on streets or in courts. The type of boarding house under consideration is usually operated by a man and his wife, who are frequently parents of a large family. Rooms are rented to the mill workers and the cooking is done for them at a small figure. There are usually three or four beds in each room, each bed being occupied by one individual during the day, and another during the night. Thus there are six or eight people to a room, one-half of whom sleep there during the day and one-half during the night.

Notwithstanding the activities on the part of the sanitary police to secure sewer connections, a number of places for one reason or another are not yet connected. This is one cause of the insanitary conditions. Another which was very noticeable was due to the collection of rubbish in the courts and yards. This of itself, while unsightly, was not insanitary except that in many instances there was clear evidence of the rubbish having been mixed with garbage, making a fly-breeding and rat-feeding center and producing a condition requiring

the attention of the health department. In many instances a proper garbage tin was not furnished.

In practically all of the houses visited the sleeping rooms were provided with one or more windows opening directly to the outside, giving adequate ventilation. Overcrowding can therefore not be called serious, provided that the windows are kept open and that there is no communicable disease introduced. Overcrowding implies close contact, which in the presence of a communicable disease is especially dangerous.

The majority of persons living under such conditions are young adult males, who must be physically fit to carry on the class of labor in which they are engaged. In fact, a study of the mortality tables which have previously been given shows that the death rate of the city is not high, but that the infant mortality rate is unduly large. The child under one year of age succumbs to conditions that have little influence over the health of the adult.

Modern dwelling houses have been constructed in several places in the city to rent for a reasonable figure. This scheme should be carried further. Much of the property in the foreign sections is really of little value and it would hardly pay to attempt any alterations or improvements. For this reason the houses should be demolished and small modern dwellings constructed to be rented to those in moderate circumstances. Where for any reason it is impracticable to obtain sewer connections, the health department should make an effort to have all outside privies screened against flies. A frequent collection by the city of rubbish as well as garbage would prevent the accumulation of such material in the courts and yards. Garbage tins should be required of every householder and an effort made to prosecute those who throw their garbage in unauthorized places. Regulations should be made to prevent overcrowding, and otherwise to regulate the use of any house as boarding, tenement, or "flop" house.

DISSEMINATION OF INFORMATION.

An annual report is issued by the board of health. This contains little or nothing of popular educational value. It is mainly statistical in nature and contains copies of recent ordinances or regulations pertaining to public health. The annual report has been limited, both as to size and distribution, by a lack of funds. In the case of tuberculosis a circular of information furnished by the State is sent to the patient.

It is necessary that the health department carry on an extensive educational campaign. It is suggested that probably the least expensive and most efficacious method would be the publication in

the newspapers of a popular article at least once each week explaining to the citizens the essentials of preventive medicine. The newspapers would no doubt be glad to cooperate in this matter.

RECEIPTS AND EXPENDITURES.

The money made available to the health department during the year 1915 from the general tax levy was \$41,220.54, as against \$158,601.79 for the service department and \$214,569.49 to the department of safety. Each of these departments also derives an income from other sources, as, for instance, license fees and the like, so that there was actually expended by the safety department during the year 1915, the sum of \$300,062.30, by the service department \$176,555, and by the department of health \$52,767.23. The latter figure includes a loan which was necessary on account of an epidemic of smallpox. This was paid back during the same year. The tabulation of expenditures shows that the health department actually expended for its maintenance \$46,600.63, including the emergency expenditures on account of smallpox. The difference between this and the \$52,767.23, quoted above, is accounted for by the payment of the loan. Excluding the emergency expenditures, it cost to maintain the health department during 1915, \$41,876.12, which represents just about the amount that it is entitled to from the general tax levy and is a sum entirely too small adequately to maintain the health department, when it is remembered that from that sum must be deducted \$22,514.99 to pay for the collection of garbage. In order that the health department may take up the active field work, which, because of the lack of funds and therefore the lack of necessary employees, it has been unable to do, it should receive not less than \$50,220 per annum, or \$9,000 per annum more than its customary allowance. Out of this sum should be paid a full-time epidemiologist at not less than \$2,500 a year and four full-time nurses at \$900 a year each. Four nurses would make a start and could do effective work especially if there could be effected a combination of all of the nurses in the city now doing public health nursing through private philanthropy. There should also be paid from this amount one additional inspector for food inspection, at \$900 per year.

Because of the lack of funds to advertise as required by law, the board of health has been unable to pass some much needed regulations or a sanitary code. This should be done without delay.

Tabulation of expenditures, calendar year 1915.

| | General adminis- tration. | Epi- demi- ological. | Diag- nostic labora- tory. | Regis- tration of births and deaths. ¹ | Milk and food inspec- tion. | Sanita- tion. | Plumb- ing inspec- tion. | Total. |
|--|---------------------------------|----------------------------|-------------------------------------|--|--------------------------------------|------------------|-----------------------------------|-----------|
| Badges..... | | | | | | \$1.00 | | \$1.00 |
| Binding..... | \$0.40 | | \$6.00 | \$9.75 | | | | 16.15 |
| Books and periodicals..... | 2.00 | | 7.50 | | | 3.50 | | 13.00 |
| Drugs, chemicals, and disin- fectants..... | | \$281.38 | 47.02 | | | | | 328.40 |
| Dues to societies..... | 8.00 | | | | | | | 8.00 |
| Emergency services..... | 6.00 | | | | \$3.00 | | | 9.00 |
| Express, freight, and drayage..... | 2.97 | | .96 | | | | | 3.93 |
| Heat, light, and water..... | 13.05 | | | | | | | 13.05 |
| Insurance..... | 2.86 | | | | | | | 2.86 |
| Miscellaneous..... | | .30 | | | 3.41 | .75 | \$1.30 | 5.76 |
| Office furniture..... | 102.20 | | | | | | | 102.20 |
| Postage..... | 81.00 | | | | | | 10.00 | 91.00 |
| Printing..... | 53.00 | 7.25 | 13.00 | | 79.50 | 32.95 | 57.75 | 243.45 |
| Removal of dead animals..... | | | | | | 264.25 | | 264.25 |
| Removal of garbage..... | | | | | | 22,514.99 | | 22,514.99 |
| Repairs and alterations..... | 13.00 | | 21.65 | | | | | 34.65 |
| Salaries: | | | | | | | | |
| Health officer..... | 1,000.00 | | | | | | | |
| Bacteriologist..... | | | 1,800.00 | | | | | |
| Inspectors..... | | | | | 2,160.00 | 6,900.00 | 3,120.00 | 16,420.00 |
| Clerks..... | 1,200.00 | | | | | | 240.00 | |
| Stationery..... | 54.25 | | 1.35 | 5.00 | | | 10.20 | 70.80 |
| Supplies..... | 5.53 | 8.50 | 153.47 | | | | .75 | 168.25 |
| Telephone and telegraph..... | 27.00 | | | | | | 13.52 | 40.52 |
| Towels..... | | | 24.75 | | | | | 24.75 |
| Transportation..... | | 22.15 | | | 329.25 | 440.30 | 659.36 | 1,451.06 |
| Traveling expenses..... | | 17.00 | | | 2.10 | | | 19.10 |
| Typewriters and repairs..... | 2.25 | | | | | | | 2.25 |
| Vaccinations..... | | 27.70 | | | | | | 27.70 |
| Total for ordinary ex- penses..... | 2,573.51 | 364.28 | 2,075.70 | 14.75 | 2,577.26 | 30,157.74 | 4,112.88 | 41,876.12 |
| EMERGENCY EXPENDITURES FROM SPECIAL BOND ISSUE ON ACCOUNT OF SMALLPOX. | | | | | | | | |
| Material and construction temporary isolation hospital..... | | 1,759.17 | | | | | | 1,759.17 |
| Supplies for hospital..... | | 440.94 | | | | | | 440.94 |
| Supplies, families in quaran- tine..... | | 861.65 | | | | | | 861.65 |
| Services: | | | | | | | | |
| Attendants at hospital..... | | 309.50 | | | | | | 309.50 |
| Guards for the mainten- ance of quarantine..... | | 1,091.25 | | | | | | 1,091.25 |
| Physicians..... | | 262.00 | | | | | | 262.00 |
| Total expenses on ac- count of smallpox..... | | 4,724.51 | | | | | | 4,724.51 |
| Total ordinary and ex- traordinary expenses..... | 2,573.51 | 5,088.79 | 2,075.70 | 14.75 | 2,577.26 | 30,157.74 | 4,112.88 | 46,600.63 |

¹ The expenses incurred in the collection of vital statistics are borne mainly by the State and county.

RECOMMENDATIONS.

As a result of the study of public health administration in Youngstown, certain definite conclusions have been reached and are made the basis of the following recommendations:

1. That for the purpose of administration the city health department be subdivided into the following divisions: The board of health, the executive office, division of epidemiology, division of milk and food inspection, division of sanitary inspection, and division of birth and death registration.

2. That a full-time epidemiologist be appointed to investigate the origin of each case of communicable disease occurring in the city, especially typhoid fever, scarlet fever, diphtheria, tuberculosis, and measles, so that preventive measures may be taken promptly at the source, the epidemiologist also to act as physician at infant-welfare stations and the like.

3. That as soon as the organization will permit there be established a sufficient number of infant-welfare stations and antituberculosis dispensaries to be maintained throughout the entire year.

4. That as soon as possible there be effected a combination of nursing forces in the city placing them in the health department under the direction of the epidemiologist.

5. That each nurse be given a district in which she shall perform all of the public health duties required.

6. That for administrative purposes the diagnostic laboratory be placed in the division of epidemiology under the supervision of the epidemiologist.

7. That a thorough study be made of and a better supervision be maintained over the milk supply of the city.

8. That to assist in maintaining this supervision an additional milk inspector be appointed by transferring one of the sanitary policemen.

9. That all of the market milk of Youngstown be pasteurized before being offered for sale to the public and that to insure the efficacy of pasteurization uniform methods be required.

10. That in order to prevent the spread of communicable diseases and to handle the child-welfare work and other public-health problems, there be added to the health department four sanitary police-women with the qualifications of a public-health nurse, their duties to include the placarding of houses and the supervision of the prophylactic measures to be taken at the home as well as duties in connection with the reduction of infant mortality and similar measures.

11. That an additional inspector be added to the food and milk division, his duties to be the inspection of places handling food and the products sold therein.

12. That the cooperation of the police force be obtained to investigate nuisances and to issue the necessary orders to abate the same.

13. That as soon as practicable an isolation hospital be constructed with a capacity of not less than 50 beds, such hospital to be used for the isolation of the common communicable diseases, tuberculosis excepted.

14. That as soon as possible the city of Youngstown and the county of Mahoning arrange to transfer their interests in the five-county

hospital to the other cities and counties interested and that a tuberculosis sanatorium be built in Youngstown to care for the tuberculous of the city.

15. That all surface wells within the city be eliminated.

16. That water mains and street sewers be extended to all parts of the city as soon as possible.

17. That the health department furnish disinfectants free of charge to families in which there is a case of typhoid fever.

18. That at the expiration of the present contract the city organize its own system of garbage collection as well as rubbish collection. That the types of wagons adopted be such that they may be used for both garbage and rubbish.

19. That each householder be required to provide a proper garbage tin.

20. That the educational work of the health department be extended.

21. That automobile transportation be furnished for the use of the epidemiologist.

22. That adequate regulations be promulgated by the board of health to provide for the care of the communicable diseases, care and disposal of manure, the regulation of tenement and lodging houses, protection of food from flies, and the like.

23. That the laws and ordinances relating to public health and the regulations, rules, and instructions of the board of health be published for the benefit of the employees of the board, so that they may carry on their duties intelligently and understand their authority.

24. That all citizens of the city cooperate with the health department in its efforts to suppress disease and that physicians make special effort to report promptly all cases of communicable diseases.

25. That special effort be made on the part of the physicians and others to report promptly all births occurring in the city.

26. That there be appropriated for use of the health department the sum of \$50,220 per annum to defray the expenses of ordinary maintenance and an additional force to consist of one epidemiologist, four public-health nurses, and one food inspector.

27. That at some future date a full-time health officer be appointed; that he receive a salary of not less than \$3,500, and that his tenure of office depend upon efficiency

28. That there be installed at the water-purification plant a method of treating the water with chlorine to be used as an emergency when the filters do not act with their usual degree of efficiency.

UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION

CITY OF BIRMINGHAM AND COUNTY OF
JEFFERSON, ALABAMA

BY

CARROLL FOX

Surgeon, United States Public Health Service

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PUBLIC HEALTH ADMINISTRATION.

CITY OF BIRMINGHAM AND COUNTY OF JEFFERSON, ALABAMA.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of health administration and organization in the city of Birmingham and the county of Jefferson. This study was carried on throughout a period of approximately three weeks.

The desirability of unifying the public-health systems of the city of Birmingham and the rest of the county of Jefferson soon became apparent, and the study was therefore made with that object in view.

Jefferson County has an area of 1,059 square miles and a population estimated at 103,999, of which 61,774 are white and 42,225 colored.

There are seven municipalities in the county. The largest, exclusive of Birmingham, is Bessemer, with an estimated population of 13,860. The smallest municipality has a population of but 350.

The principal industries of the county are mining, the manufacture of steel and iron and their products, and agricultural pursuits.

The city of Birmingham covers an area of 50 square miles, and has a population estimated at 174,108, of which 105,459 are white and 68,649 colored.

The principal industries of the city of Birmingham are the manufacture of steel and iron and their products.

For information and assistance received in the preparation of this report the writer is indebted to the officials of the city and the county health departments, to other officials, and to various other citizens interested in the public health.

COUNTY OF JEFFERSON.

The county medical society is, under the law, the county board of health, as well as the board of health for the municipalities within the county boundaries.

The board of censors of the county medical society acts as the board of health ad interim.

This board of health appoints both county and city health officers. The law provides for both full-time and part-time county health officers, and specifies that the county health officer may also act as city health officer.

In the case of the full-time county health officer, the law specifies the salary that shall be paid. The amount of this salary is based upon the population.

In Jefferson County the health officer was appointed as a part-time official, but at present is practically a full-time health officer.

¹ Reprint from the Public Health Reports, vol. 31, No. 45, Nov. 10, 1916, pp. 3086-3113.

He receives \$3,000 per annum and is provided with a clerk and three sanitary inspectors.

Powers and duties of the full-time county health officer.—To visit as far as practical all cases of communicable diseases for the purposes of enforcing measures to prevent the spread; to make especial efforts to locate all cases of tuberculosis and pellagra for the purpose of urging prompt treatment or to give instructions to prevent the spread of the disease; to inspect the schools and school children of the county at least once annually; to educate the people and the dealers in food products of the importance of protecting food from dust and insects; to disseminate information by lectures, newspaper articles, demonstrations, etc.; to instruct the people how to maintain sanitary conditions, to provide themselves with pure drinking water, pure milk, and sanitary closets; to make the necessary reports; to attend meetings of the court or board of revenue for the purpose of giving such court or board information as affects the public-health interests of the county; and to discharge such other duties as may be required by law.

Discussion.—During the course of the study the following places were visited: The municipalities of Bessemer and Leeds; Maxine, a mining camp; several camps operated by the Tennessee Coal, Iron & Railroad Co.; and two penal camps. During these visits the opportunity was taken to look superficially into rural conditions.

With the exception of the camps operated by the Tennessee Coal, Iron & Railroad Co., it must be said that conditions were found to be bad and preventable diseases prevalent, including typhoid fever, malaria, hookworm, pellagra, and tuberculosis.

According to figures received from the office of the county health officer, there occurred in the county of Jefferson, exclusive of the city of Birmingham, during the 12 months period ended June 30, 1916, 1,018 deaths. There was, therefore, a crude death rate of 9.78 per 1,000. Among the white population there were 412 deaths, giving a death rate of 6.5 per 1,000, and among the colored population there were 616 deaths, giving a death rate of 14.58 per 1,000.

It can be assumed that these low rates do not indicate the true conditions, and it must, therefore, be concluded that the deaths occurring in the county are not all reported.

During the same period there was reported a total of 2,077 births, of which 1,453 occurred among the white population and 624 among the colored population, making a total birth rate of 19.97—a white birth rate of 23.52 and a colored birth rate of 14.77 per 1,000.

The number of cases of and the deaths from certain of the communicable diseases reported during the same period were as follows:

| | Cases. | Deaths. | | Cases. | Deaths. |
|-----------------------------|--------|---------|--------------------|--------|---------|
| Pulmonary tuberculosis..... | 43 | 143 | Smallpox..... | 5 | 0 |
| Typhoid fever..... | 157 | 34 | Diphtheria..... | 21 | 7 |
| Malaria..... | 39 | 9 | Scarlat fever..... | 25 | 3 |
| Pellagra..... | 47 | 34 | | | |

The county of Jefferson offers magnificent opportunities to carry on intensive work along the line of preventive medicine, which

should be productive of great benefit to the communities concerned. Communicable diseases existing in the county may be readily introduced into the cities, and vice versa, and it would seem futile to perform the preventive work unless it was carried on in the county and the cities simultaneously. For this reason the suggestion that the health departments of the cities and the county be combined and placed under one controlling head would seem highly desirable.

Such an organization should, in fact, be considered ideal. The arrangement would contemplate a full-time executive officer, occupying the dual position of health officer for the county and the municipalities included within its boundaries. He should have under him two assistants, each in charge of a subdepartment, one the health department of the city of Birmingham and the other the health department of the county and other municipalities.

The two assistants appointed to aid the executive officer should be relieved of all executive or administrative work, and should be required to assume charge of the field operations of the subdepartments. They would be essentially epidemiologists of their respective departments, and would also render the professional services at the child welfare, antituberculosis, or other public-health dispensary operated by the health department.

The amount required to maintain a health department for the county capable of performing the work required to place it in a sanitary condition and to eradicate disease among the people would be \$30,870.

The assessed valuation of the property in the county amounts to \$147,000,000. On this there is levied a tax of 7 mills, which produces an income of \$1,029,000; \$30,870 represents 3 per cent of this amount, and is little enough to spend in the interest of the public health.

It should be expended about as follows:

| | |
|--|---------|
| 1 county health officer and health officer for the cities, not less than | \$3,500 |
| 1 assistant health officer for county, not less than | 2,500 |
| 1 sanitary engineer, not less than | 2,000 |
| 1 clerk and registrar | 1,200 |
| 5 public-health nurses, at \$75 per month | 4,500 |
| 5 sanitary inspectors, at \$80 per month | 4,800 |
| 1 bacteriologist | 2,100 |
| 1 laboratory assistant | 840 |
| | <hr/> |
| | 21,440 |
| Transportation, lanterns and slides, office and laboratory supplies, printing, etc | 9,430 |
| | <hr/> |
| | 30,870 |

The city of Bessemer receives an income for general expenditures of approximately \$100,000. Five per cent of this amount, or \$5,000, should be set aside for the employment of a force of workers in and around the city of Bessemer and to supplement the force employed by the county.

This sum would be sufficient to employ a man trained in sanitary science as assistant health officer, one sanitary inspector, and two public-health nurses.

Upon the completion of an organization as contemplated above the county should be divided into five districts, exclusive of the cities of Birmingham and Bessemer, in each of which there should be placed a public-health nurse and a sanitary inspector, with facilities for transportation. An office should then be opened and a portable laboratory established at a convenient point in each of these districts consecutively and an intensive survey carried on, together with an energetic campaign of education.

ADMINISTRATION AND ORGANIZATION IN THE CITY OF BIRMINGHAM.

In accordance with the statute the board of health has appointed a health officer for the city of Birmingham. He is a part-time official and receives at present a salary of \$600 per annum. This health officer also acts as city physician, receiving an additional salary of \$75 per month for his services in that capacity.

In all questions involving health and sanitation the health officer acts under the direction of the county board of health and the board of city commissioners.

Powers and duties of health officer of city of Birmingham.—To keep a record of births, deaths, and reportable diseases; to exercise general supervision over the public health of his community; to investigate cases of communicable diseases and report results to the board of commissioners, the committee of public health of the county board of health, and to the State health officer; to keep on hand a supply of vaccine virus and to vaccinate all indigent persons applying for vaccination; to inspect the municipality once each month as well as the municipal prisons, charitable institutions, etc., within the city once each month relative to ventilation, sewage disposal, etc.; to make reports required by law; to attend conferences of health officers when summoned by the State health officer; and to perform such other duties as may be required.

Personnel.—The following is a list of the employees of the city health department, together with their annual salaries:

| | |
|--|-------|
| 1 health officer | \$600 |
| 1 registrar of vital statistics | 960 |
| 1 clerk | 840 |
| 1 chief sanitary inspector | 1,800 |
| 7 sanitary inspectors, at \$960 | 6,720 |
| 1 communicable-disease nurse | 900 |
| 1 chief meat and milk inspector and bacteriologist | 2,100 |
| 1 assistant milk inspector | 1,140 |
| 1 assistant meat inspector | 1,140 |
| 1 assistant meat inspector | 960 |
| 2 food inspectors, at \$900 | 1,800 |
| 1 physician to pesthouse (part time) | 600 |

In addition to the above there is one communicable-disease nurse loaned and paid for by the children's hospital for emergency work in connection with typhoid fever.

There is also one infant-welfare nurse, employed by private philanthropy, who works under the supervision of the health department, and there are loaned for emergency purposes by the police department eight patrolmen, who act as sanitary inspectors.

Sanitary inspectors.—There are seven sanitary inspectors, who work under the supervision of a chief inspector. They are required to perform, in addition to sanitary work, certain epidemiological duties which should devolve upon a corps of employees having greater technical knowledge. As in many other cities, much of their time is given over to the investigation of complaints, many of which have little bearing upon the public health.

There are six matters which have an important bearing on the public health and to which sanitary inspectors should give special attention. If their entire time were taken up in this way they would be doing extremely important work.

These things are as follows: The abolition of surface privies, the elimination of the surface well, the proper disposal of manure, the proper garbage receptacle, the elimination of stagnant water breeding mosquitoes, and the regulation of housing conditions. The proper regulation of all these matters would go far to insure a healthy city.

Transportation.—The health department maintains three automobiles—one for the use of the chief sanitary inspector, one for the use of the chief meat and milk inspector, and one for the dairy inspector.

In addition to these the sanitary inspectors are furnished with two motorcycles and three bicycles.

The inspectors of the health department receive free transportation on the street railway.

Office hours of department.—The health department is open from 8 a. m. to 5 p. m. daily. The Sunday hours are from 9.30 a. m. to 10.30 a. m. One hour is allowed each employee for lunch. On Saturday the office closes at 12 o'clock, except for two employees, who remain to perform emergency work. Ten days' vacation is allowed each employee annually with pay.

REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths is provided for by statute. The city of Birmingham is in the registration area for cities. The law does not provide for reimbursement for certificates of births and deaths registered by local registrars.

Registration of deaths.—In computing the following statistical information figures for the 12-month period ended June 30, 1916,

were used. During this time there were recorded in the health department 2,528 deaths (exclusive of stillbirths), which, in a population of 174,108, gave a crude death rate per 1,000 of 14.5. The death rate among the white population was 10.6, while the colored death rate was 20.4 per 1,000. There were reported during this period 295 stillbirths.

Preventable diseases.—There were reported to the health department during the same period 1,507 deaths from causes that might be classed as preventable, or 59.6 per cent of the total deaths recorded.

These causes are given more in detail in the following table, which also shows the death rate per 100,000 and other pertinent information:

| Disease. | Number of cases reported. | Number of deaths (all ages). | Death rate per 100,000. | Case fatality rate per 100. | Number of deaths in children under 1 year. |
|---|---------------------------|------------------------------|-------------------------|-----------------------------|--|
| | | | | <i>Per cent.</i> | |
| Tuberculosis, pulmonary..... | 514 | 294 | 168.8 | 57.2 | 3 |
| Tuberculosis, other forms..... | | 60 | 34.4 | | 5 |
| Typhoid fever..... | 528 | 58 | 33.2 | 10.9 | 0 |
| Diphtheria..... | 137 | 14 | 8.0 | 10.2 | 2 |
| Smallpox..... | 3 | 0 | | | 0 |
| Whooping cough..... | 48 | 8 | 4.3 | | 2 |
| Measles..... | 95 | 1 | | | 0 |
| Scarlet fever..... | 110 | 2 | | | 0 |
| Pollagra..... | 79 | 86 | 49.3 | | 0 |
| Malaria..... | | 16 | 9.1 | | 0 |
| Influenza..... | 41 | 41 | 23.5 | | 2 |
| Tetanus..... | | 6 | 3.4 | | 2 |
| Dysentery..... | | 7 | | | 1 |
| Septicemia (including puerpera)..... | | 25 | | | 0 |
| Syphilis..... | | 55 | | | 14 |
| Gonorrhea..... | 1 | 1 | | | 0 |
| Pneumonia..... | | 216 | 124.0 | | 34 |
| Diarrhea and enteritis..... | | 120 | 68.9 | | 68 |
| Cerebrospinal meningitis..... | | 8 | 4.5 | | 0 |
| Bronchitis..... | | 20 | | | 5 |
| Malignant growths..... | | 91 | 52.2 | | 1 |
| Accidental deaths..... | | 190 | | | 8 |
| Premature births..... | | 87 | | | 87 |
| Congenital debility..... | | 36 | | | 36 |
| Other causes peculiar to early infancy..... | | 65 | | | 65 |
| Total..... | | 1,507 | | | 335 |

Infant mortality.—The infant mortality rate in the city during the 12 months' period ended June 30, 1916, was 107 per 1,000 births, there having been 335 deaths in infants under 1 year of age. For practical purposes all of these deaths can be considered preventable. The infant mortality rate among the white population was 81.1, while among the negroes it was 166.6. The above table gives the causes of death under 1 year in detail.

Registration of births.—There were registered with the health department during the 12 months' period ended June 30, 1916, 3,128 births, giving a birth rate of 17 per 1,000. The number of births among the white population was 2,144, making a birth rate of 20.3, while among the colored population there were 984 births reported, giving a birth rate of 14.3 per 1,000.

EPIDEMIOLOGICAL ACTIVITIES.

The Report of Diseases.

Requirements of law.—In accordance with State law the following diseases must be reported promptly by physicians to the health officer. Heads of families are also required to report such diseases when no physician is in attendance.

| | |
|--|--------------------------------------|
| Actinomycosis. | Pellagra. |
| Anthrax. | Plague. |
| Beriberi. | Poliomyelitis (infantile paralysis). |
| Chicken-pox. | Scarlet fever. |
| Cholera (Asiatic). | Smallpox. |
| Diphtheria (membranous croup). | Tetanus. |
| German measles (R  theln). | Trachoma. |
| Glanders. | Tichinosis. |
| Hydrophobia. | Tuberculosis (pulmonary). |
| Leprosy. | Typhoid fever. |
| Malaria. | Typhus fever. |
| Measles. | Whooping cough. |
| Meningitis (epidemic cerebrospinal). | Yellow fever. |
| Mumps. | |
| Ophthalmia neonatorum (conjunctivitis of new-born children). | |

Persons suffering with a communicable disease must not be removed or brought into the city.

Wherever quarantine has been established at any room, apartment, or premises it is unlawful for any person under 15 years of age to leave the same without a permit from the health officer.

Wherever any case of communicable disease is being treated in any room or apartment that exposes the people of the immediate vicinity to the danger of contracting the disease, the health officer may remove the case to another room or apartment where the danger of communication is less likely to occur.

The quarantining of bacillus carriers is authorized.

The use of the common towel and the common drinking cup is prohibited in any hotel or passenger railway station in the city of Birmingham.

Whenever smallpox is declared by the commission likely to become epidemic it is the duty of all citizens to cause themselves to be vaccinated until the operation proves effective, and to have all children under their care vaccinated. A certificate of immunity may be accepted in lieu of vaccination.

Whenever the health officer believes that any person has been exposed to smallpox he is granted authority to order that such person be vaccinated, and it is the duty of said person after such order is received to be vaccinated within 24 hours.

No child is allowed to enter any of the public schools of the city who has not been vaccinated. Each child applying to enter any of the schools must be vaccinated or present a certificate from a reputable physician that he or she has been successfully vaccinated.

Ordinances also provide for the disinfection of apartments after death or removal of a case of tuberculosis and for the removal of a patient to a suitable place, where it is deemed necessary by the health officer to prevent the spread of the disease, and they prohibit the attendance at school of pupils or instructors who are suffering from tuberculosis, etc.

In addition to the above there are other ordinances granting authority to the city commission to establish quarantine if necessary and regulating the holding of public funerals of persons dead of certain of the communicable diseases, etc.

Methods of procedure.—In reporting diseases physicians make use of the telephone in the majority of instances. Blank forms are provided for the purpose of reporting, but, except in the case of tuberculosis, are rarely utilized. In the case of all diseases, except tuberculosis, the information obtained by telephone is entered upon a card devised for that purpose as well as in a register. A separate book is used to register cases of tuberculosis. A monthly report is made to the county health officer of all cases reported to the city health department.

Control of Diseases.

Requirements of law.—The most important ordinances relating to the control of diseases are summarized as follows:

When authorized by the commission to incur the expense, the city health officer is required to take charge of the necessary measures to combat any communicable disease.

The city health officer is authorized under certain restrictions to remove any person not in his own home suffering from a communicable disease to such place as may be provided for the purpose.

It is forbidden to conceal any case of communicable disease.

It is forbidden for any person suffering from any communicable disease to leave the premises without permission. The same restriction applies to the nurse or attendant upon the sick person.

It is the duty of any person owning or occupying premises where a case of communicable disease has been, to thoroughly cleanse and disinfect the same.

Methods of procedure.—The card upon which is entered the report of a disease is also used to note the information obtained after epidemiological investigation. Such investigation is made by the sanitary inspectors, and is more or less complete in the case of typhoid fever. In the case of scarlet fever and diphtheria, the information is obtained only as to the source of the milk supply and the history of contact. The methods of handling the common communicable diseases are shown in the table which follows later on.

The sanitary inspectors placard houses and perform the necessary disinfection.

There is no hospital for the isolation of any communicable disease except smallpox.

Typhoid fever.—Typhoid fever is endemic in the city of Birmingham and very recently has assumed the proportions of an epidemic. There were reported during the 12 months' period ended June 30, 1916, 528 cases of typhoid fever and 58 deaths. The death rate during that period was 332 per 100,000 and the case fatality rate was 10.9 per cent.

An annual death rate of 33.2 is not unusual in Birmingham. It is not unlikely, judging from the case-fatality rate, that there are a number of cases of typhoid fever which are not reported to the health department.

The city water supply of Birmingham is excellent. There are, however, a number of conditions existing in the city which account for the continued prevalence of typhoid fever.

The principal of these causes are the insanitary privy and the great number of flies. To this may be added the opportunity of infection through direct contact with cases or carriers.

Tuberculosis.—There were reported to the health department during the 12 months' period ended June 30, 1916, 514 cases of and 294 deaths from pulmonary tuberculosis. There was, therefore, a death rate during that period of 168.8 per 100,000 and a case-fatality rate of 57.2 per cent.

It is obvious that this high death rate calls for some active work on the part of the health department. The high case-fatality rate shows conclusively that there are many cases of tuberculosis not reported.

Antituberculosis activities.—The antituberculosis activities of the city and county are carried on by the county antituberculosis association.

There are employed in the work two nurses, one of whom is colored, and the necessary physicians who give their services free of charge.

A sanatorium with a capacity of 34 beds is maintained. In this sanatorium are taken both advanced and incipient cases. A dispensary operated by the society is open twice a week under the supervision of a physician. Here the necessary professional work required in the diagnosis of tuberculosis is performed.

The nurses are engaged in the usual work connected with such activities, both within the city and to some extent in the county. Sputum cups and napkins are furnished free of charge to patients as well as literature on the subject of the prevention and cure of tuberculosis.

The expenses of the society are defrayed by funds raised through private philanthropy and the sale of Red Cross stamps and by assistance from the county.

There has recently been inaugurated by the society an open-air school for children from tubercular families or children who are anemic, tubercular, or otherwise in need of the advantages offered by such an institution.

It is located in an unimproved city park. For protection against inclement weather there is provided a well-screened pavilion, open on all sides and furnished with roll curtains made of awning material. The toilet is of the pail type protected against the ingress of flies.

One meal a day is provided and milk is furnished three times a day. It is expected to continue this school throughout the winter months.

The tuberculosis sanatorium.—The tuberculosis sanatorium is pleasantly located just without the city limits. The expense of maintenance is borne by the antituberculosis association with some assistance from the county. It comprises a building in which is located the kitchen and mess hall, nurses' quarters, and two pavilions which will accommodate approximately 34 cases. Another pavilion is at present under construction.

Both incipient and advanced cases are taken. The latter are taken because there is no other place to care for them. Chickens and vegetables are raised at the institution. Milk is obtained from outside sources. Water is derived from the city water supply and sewage is disposed of by means of a septic tank.

Smallpox.—During the 12 months' period, ended June 30, 1916, there were but three cases of smallpox reported, all among the colored race.

The usual practice in combating this disease is to isolate the case in the county smallpox hospital and vaccinate all contacts, after which no quarantine is required. If for any reason the case can not be removed, contacts are vaccinated and placed under quarantine.

Smallpox hospital.—The smallpox hospital is owned and maintained by Jefferson County. It is located approximately 4 miles outside of the city limits.

It is built on the pavilion plan. All buildings are constructed of wood. There is a residence which is occupied by the caretaker of the hospital. There are four buildings used for the isolation of patients—two for white and two for colored. A small house is provided at each pavilion for the physician to change his clothing before seeing a case.

Sewage is disposed of by means of the insanitary surface closet. Water is obtained from a surface well and is not piped to the pavilions. Approximately 75 patients may be cared for at the smallpox hospital, and there is plenty of land on which to erect tents if necessary.

Diphtheria.—During the 12 months' period ended June 30, 1916, there were reported to the health department 137 cases of diphtheria and 14 deaths, giving a death rate of 8 per 100,000, and a case-fatality rate of 10.2 per cent. This case-fatality rate is too high if antitoxin is used promptly and in sufficient quantities. The State will furnish antitoxin free of charge to indigent cases.

Swabbings from throats of contacts is not performed as a routine measure, and contacts over 15 years of age may be permitted to carry on their vocation or attend school without having swabbings taken.

Malaria.—During the 12 months' period ended June 30, 1916, there were reported 16 deaths from malaria, making a death rate per

100,000 of 9.1. In this connection it may be said that it is an easy matter to find anopheline mosquitoes breeding within the city limits, as determined by personal observation.

Infant mortality.—During the 12 months' period ended June 30, 1916, there were reported to the health department 335 deaths in infants under 1 year of age, making an infant mortality rate of 107 per 1,000 births. The high infant mortality occurs in the colored race, being 166.6, while the white race showed a rate of 81.1.

Infant welfare activities.—The infant welfare activities are carried on by one nurse, who is paid out of funds raised by private philanthropy, and who works under the supervision of the health department.

The method of procedure is to follow up all births reported from certain districts and to give the necessary instruction by word of mouth and by practice, in the way to care for the infant, including bathing, feedings, and clothing. Information relating to the need of nursing care in specific instances is also received from the various free medical dispensaries in the city.

Some prenatal work is also performed, as well as work of a purely charitable nature. The latter is required because the activities previously carried on by the associated charities have recently been taken over by the city, and the new organization is not yet completed.

Ice and milk are furnished in limited quantities where necessary, as well as drugs and commercial infant foods. The poor are also helped financially in other ways.

Discussion.—In studying the activities of the health department it is necessary to keep in mind two important matters—the work that is directly concerned with the environment and the work that is directly concerned with the individual.

In Birmingham the health department is fairly well equipped to care for the former, but very inadequately provided with means to supervise the health of the individual.

A proper supervision over the case and the carrier is considered, according to modern views, the important side of public health work, and therefore the important unit of the health department from this viewpoint is made up of the epidemiologist, the bacteriologist, and the public-health nurse.

In Birmingham an epidemiologist is not employed at all, and the nursing staff is inadequate in number. If the work of the nurses now employed by various bodies were properly correlated, it would be productive of better results.

It is therefore essential that a full-time physician versed in the science of preventive medicine be appointed in the health department to carry on the epidemiological work in connection with all cases of communicable diseases, but more especially in the cases of

typhoid fever, tuberculosis, diphtheria, and scarlet fever, and to furnish the professional services required at infant welfare stations and the antituberculosis dispensary, which should be maintained by the health department in certain sections of the city.

To assist the epidemiologist there should likewise be provided a corps of not less than 10 public-health nurses. The city should then be divided into 10 districts. In each there should be placed a nurse to perform within her district all of the public-health duties required; i. e., prenatal and infant welfare work, communicable disease nursing, including antituberculosis activities, and school nursing.

In order to bring this about it would be wise to combine the present public-health nursing forces of the city by placing them in the health department under the supervision of the epidemiologist. Such nurses should be paid by the health department.

This would make available moneys now collected through private charities to be used for purposes which are strictly charitable and not of a public-health nature.

It would seem advisable for the school authorities to enter into such an arrangement, turning their nurses over to the staff of the health department. They would then have for school work 10 nurses instead of 2, as at present.

It is recognized that to a large extent the common communicable diseases are disseminated through direct contact of a healthy person with one suffering from a communicable disease.

It is therefore essential to eliminate the focus of infection by isolating the patient or carrier in an institution constructed for that purpose. This means the erection of a hospital in the city of Birmingham to care for all cases of communicable diseases except tuberculosis. Such an institution should contain not less than 30 beds.

In the case of tuberculosis the same argument applies, and it is therefore necessary to have an institution where tuberculous patients who are discharging tubercle bacilli could be properly isolated, thus removing a focus of infection which is a menace to the community.

It is therefore desirable that the county of Jefferson erect a tuberculosis sanatorium, for which it already has the legal authority, to care for advanced cases of tuberculosis originating within its boundaries, including the city of Birmingham. Such an institution should contain not less than 100 beds. Proper ordinances should be enacted compelling advanced cases of tuberculosis to go to the sanatorium.

It would then be possible for private philanthropy to expend its funds in the maintenance of the present tuberculosis sanatorium, which could be used for incipient cases only.

Tabulation of the methods used in Birmingham to prevent the spread of communicable diseases.

| Disease. | To be reported. | To be placarded. | Isolation of patient. | Quarantine of contacts. | Terminal fumigation. | Sale of dairy products. | Exclusion from school. | | Special precautions. | Disinfection of discharges required. |
|---------------------|-----------------|------------------|--|---|--|---|--|--|--|--|
| | | | | | | | Patient. | Contacts. | | |
| Diphtheria..... | Yes..... | Yes..... | Yes, until 2 consecutive negative cultures have been obtained. Yes..... Yes..... | Yes, of all under 15 years if patient adequately isolated. Same..... Yes, except those who have had the disease. Contacts vaccinated but not quarantined. None..... | Yes..... Yes..... None..... Yes..... None..... | Prohibited..... Same..... Same..... Same..... Same..... | Yes..... Yes..... Yes..... Yes..... Yes..... | All under 15 years. Yes, of nonimmunes only. Until after vaccination and observation for 14 days. No..... | Isolation of bacillus carriers required. None..... None..... Vaccination of all contacts. Disinfection of bedding and clothing required before laundering. Nurses of anti-tuberculosis society visit and instruct patient. None..... | None. None. None. None. Yes, of feces and urine. None. None. |
| Scarlet fever..... | Yes..... | Yes..... | Yes, in isolation hospital. None..... | None..... | Yes..... | Same..... | No..... | No..... | None..... | None. |
| Measles..... | Yes..... | Yes..... | Yes, if not taken to isolation hospital. No..... | None..... | Yes..... | Same..... | Yes..... | Yes, of nonimmunes only. | None..... | None. |
| Smallpox..... | Yes..... | Yes..... | Yes, in isolation hospital. None..... | None..... | Yes..... | Same..... | Yes..... | Yes, of nonimmunes only. | None..... | None. |
| Typhoid fever..... | Yes..... | Yes..... | Yes, in isolation hospital. No..... | None..... | Yes..... | Same..... | Yes..... | Yes, of nonimmunes only. | None..... | None. |
| Tuberculosis..... | Yes..... | No..... | None..... | None..... | Yes..... | Same..... | No..... | No..... | None..... | None. |
| Whooping cough..... | Yes..... | No..... | Patient permitted to leave premises, and required to wear green cross on sleeve. Yes..... | None..... | None..... | Not prohibited. | Yes..... | No..... | None..... | None. |
| Chicken pox..... | Yes..... | Yes..... | Yes..... | Yes, of nonimmunes only. | None..... | Same..... | Yes..... | Yes, of nonimmunes only. | None..... | None. |

The Diagnostic Laboratory.

The diagnostic laboratory is located in a large, well lighted, and ventilated room in the city hall. There are employed in the work one bacteriologist, who is also chief meat and milk inspector, and one clerk, who is engaged temporarily on account of the emergency which arose during the recent typhoid epidemic.

The routine work of the laboratory consists of the necessary examinations for the diagnosis of typhoid fever, tuberculosis, malaria, diphtheria, hookworm and other intestinal parasites, and gonorrhea, and for the release of quarantine for diphtheria. Chemical analyses of milk are also made, and some water work is performed.

In order to submit blood specimens to be tested for the Widal reaction, Wright's capsules are furnished to the physicians. For the submission of specimens of sputum a small, wide-mouth bottle, with a cork stopper, is furnished. In the case of diphtheria the specimen outfit consists of a tube of Loeffler's blood serum and a sterile swab. In this connection it may be stated that smears are usually made from the inoculated swabs, with the result that a diagnosis may often be made before the culture has incubated.

With the exception of some of the Loeffler's blood serum, all culture media is manufactured in the laboratory.

The laboratory is equipped to perform all of the work that is ordinarily required, although some of the apparatus is worn out and should be replaced.

Data blanks are required to be furnished by the physicians with each specimen submitted for examination. These blanks are the same for all specimens, and contain spaces for date, name of patient, the disease to be determined, residence of patient, and physician's name. A daily record is kept of all examinations made. The report of the results of these examinations is made by telephone.

Tabulation of examinations made in the diagnostic laboratory, year ended June 30, 1916.

| | Positive. | Negative. | Total. |
|-------------------------------------|-----------|-----------|--------|
| Typhoid fever (Widal reaction)..... | 553 | 1,590 | 2,143 |
| Malaria..... | 8 | 258 | 266 |
| Tuberculosis..... | 219 | 827 | 1,046 |
| Diphtheria..... | 86 | 890 | 976 |
| Gonorrhea..... | 29 | 103 | 132 |
| Hookworm..... | 1 | 69 | 70 |
| Meningitis..... | 1 | 6 | 7 |
| Milk (chemical)..... | | | 1,550 |
| Total..... | 897 | 3,743 | 6,190 |

Discussion.—The desirability of establishing an organization which would care for the public health of both the county and the city has already been pointed out. Provision should be made for a

county laboratory which should be made available to the physicians and health officers of the county as well as of the municipalities. This would involve the transfer of the present city laboratory to the county.

There will be needed in the laboratory an attendant who could perform the duties of a nontechnical assistant, such as cleaning glassware, making culture media, reports, etc.

It would then be desirable to enlarge the scope of the laboratory, making it possible to have Wasserman reactions determined.

Distributing stations should be established and located at convenient points in the city and county so that physicians may secure mailing outfits with facility.

MUNICIPAL ENGINEERING ACTIVITIES.

The City Water Supply.

The city water supply is owned by a private corporation, and is derived from two different sources—Five Mile Creek and the Cahaba River.

There are two purification plants at which the water from these sources is treated in practically the same way—namely, by sedimentation, coagulation with alum, filtration, and chlorination.

The smaller plant comprises 2 sedimentation and 1 clear-water basin, and 10 filters, each with a capacity of 500,000 gallons. Here hypochlorite is used as a disinfectant.

The larger plant comprises 2 sedimentations and 1 clear-water basin, and 38 filters, each with a capacity of 500,000 gallons. Here liquid chlorine is used as a disinfectant.

Close check is maintained on the quality of the water by a chemist employed by the company.

The methods pursued in securing a pure-water supply for the city are modern and efficacious, as may be seen from the following results obtained in the laboratory:

During the year 1915 the average count of 280 samples of raw water planted on agar and incubated at 20° C. was 3,358. After final treatment the count was 2.2, meaning an efficiency of 99.94 per cent.

During the same period the average count of 280 samples of raw water planted on agar and incubated at 38° C. was 2,091. After final treatment the count was 3.3, showing an efficiency of 99.84 per cent.

The colon bacillus was not found at all in 280 ten c. c. samples of purified water. These figures are for the North Birmingham plant, which has to deal with raw water somewhat more highly polluted than that of the other supply.

At the Cahaba plant during 1915 the average count of 193 samples of raw water planted on agar and incubated at 20° C. was 1,399. After final treatment the average count was 1, meaning an efficiency of 99.86 per cent.

On agar kept at 37° C. the count for 193 samples averaged 556, and after final treatment 1.4, meaning an efficiency of 99.74 per cent.

The bacillus coli was found but once (October) in 193 ten c. c. samples.

In addition to the check kept on the water at the plants there are frequent examinations made from taps in various parts of the city.

Of 1,106 samples collected in this way the average count on agar at 20° C. was 9.3, while the average count on agar at 38° C. was 7.3.

In 1,106 ten c. c. samples examined during the year 1915 but two showed the presence of colon bacilli—one in the month of June and one in the month of October.

It is estimated that approximately 90 per cent of the inhabitants of the city use city water, the rest deriving their water supply from surface wells and springs. This is a dangerous proceeding in a limestone country, as the chances for pollution are great. Therefore all wells and springs should be eliminated, and it should be compulsory for all persons within the city to supply themselves with city water.

Disposal of Sewage.

Sewers have been made available to about three-fourths of the population of Birmingham.

The sewage is disposed of by means of two plants, where it undergoes septic action and oxidation in contact beds.

The sewers located in the older part of the city are at present too small for the purpose, as they were planned and laid for a much smaller community.

In addition to the sanitary sewers there is also a system of storm-water sewers.

One of the greatest evils to be found in the city is the dry surface closet open to flies. There are approximately 8,000 of these closets in the city, which no doubt accounts to a large extent for the endemic typhoid fever.

It is essential that these surface closets be abolished without delay. Houses should be made to connect to the sewer where such is available. There is already sufficient law to compel sewer connections. Where there is no sewer the installation of a sanitary dry closet should be insisted upon. The necessary ordinance has already been enacted and the attention of the sanitary inspectors, as well as the patrolmen of the police department, should be concentrated on this matter. One inspection is quite enough to determine when the nui-

sance exists, and written orders to abate the same should be issued immediately. If in the time allotted reinspection shows that the approved type of closet has not been installed, the case should be brought to the attention of the court. This is an emergency measure that should be pushed to the limit.

The city collects night soil, charging the householder 35 cents per month for the service. The fecal matter is dumped into cans which are taken to a central point and the contents emptied into a sewer. The cans are then thoroughly washed.

Collection and Disposal of Garbage and Rubbish.

The collection and disposal of refuse is carried on by the city street department. The city owns its own wagons and horses and collects every day in the congested part of the city and from the residential districts once a week.

A city ordinance requires householders to maintain a properly covered garbage tin in which to place garbage and rubbish other than ashes. A separate receptacle must be provided for ashes.

There are four incinerators in the city, each of which is of an old type and capable of disposing of a part only of the refuse collected. In fact, they will not incinerate pure garbage at all without the addition of fuel. Therefore a large part of refuse including garbage is dumped—a proceeding not consistent with good sanitation, especially under the conditions existing in Birmingham. On the other hand, the use of rubbish free from organic matter as a fill in low-lying areas of the city is an excellent procedure, as material otherwise useless thus becomes valuable for reclaiming land and frequently results in the eradication of mosquito-breeding centers.

At present there are being recovered from the refuse certain products of some value as junk, as, for instance, rubber, paper, cans, bottles, etc. While ordinarily this would be a good plan, it becomes more or less objectionable in Birmingham because with this material is mixed a great deal of organic matter in the shape of garbage.

Some statistics relative to garbage and rubbish collection during year 1915.

GARBAGE AND RUBBISH.

| | |
|---------------------------------|--------|
| Average number of loads daily | 222 |
| Weight per load (approximately) | 1, 500 |
| Double teams used | 37 |
| Men employed: | |
| Paid labor | 58 |
| Convicts | 42 |
| Foremen employed | 11 |

COLLECTION OF NIGHT SOIL.

| | |
|--|-------------|
| Single carts..... | 16 |
| Double teams..... | 1 |
| Men employed..... | 18 |
| Loads for the year, averaging 300 pounds per load..... | 11,923 |
| Number of tons..... | 1,288 |
| Total pay roll for both departments..... | \$42,669.70 |
| In use July, 1916, to collect garbage and rubbish: | |
| Double teams..... | 26 |
| Single teams..... | 1 |
| Men employed..... | 57 |
| Foremen..... | 6 |

MILK AND FOOD INSPECTION.

Control of the Milk Supply.

There are at present engaged in this work the bacteriologist of the health department, who is the chief milk inspector, and one assistant to carry on in part the inspection of dairies, together with the inspection of milk depots and the collection of specimens where necessary.

Before any person may engage in the milk business he is required to secure a permit from the health department, which is issued free of charge after an inspection of the premises. There are two permits in use—one for milk-producing establishments and one for stores selling milk.

The ordinances providing for safe milk are adequate except that there is no requirement that milk be pasteurized except when used in the manufacture of ice cream. This ordinance was recently enacted because of the typhoid outbreak. Neither is there an ordinance requiring that all milk be sold in original packages. It is estimated, however, that 75 per cent of the milk sold in the city is delivered in that manner, an ordinance requiring that when so sold it must be bottled at the producing farm or milk depot.

Dairies are scored according to the methods used by the Department of Agriculture. An inspection of a few of these dairies showed that the health department, through educational means, has been making commendable efforts to improve the condition of the dairies, and that the dairymen were sufficiently progressive to profit by the instruction received. Dairy barns were clean, well lighted, and ventilated, and had clean wooden or concrete floors, with provision made for drainage. Cow yards were well drained; the small-top milk pail was in use; milk houses were separate from the barns and screened from flies. All producing farms inspected were provided with the pail system for the disposal of fecal matter. The method of application of this system, however, could be improved in several instances.

Provision was made for sterilizing, mostly by means of small steam boilers. Ice was used in every case and, in the majority of instances, milk cooled immediately and rapidly by an approved form of cooler through which ice water circulated.

Bottling and capping were done by hand in every instance. The character of the dairies makes it possible to produce a fairly clean milk provided the principles of cleanliness are applied.

Heretofore the tuberculin test has been applied to all the milch cattle, but because of the policy of retrenchment necessitated on the part of the city government, due to a lack of funds, the services of some necessary employees were discontinued, and the tuberculin test was therefore abandoned for the time being at least.

No bacterial counts of the market milk of Birmingham have been made in the laboratory for some time. The reason for this is the lack of the necessary assistance in the laboratory to perform the various duties required.

Discussion.—A majority of the producing farms supplying milk to the city of Birmingham (approximately 145 in number) are located within a radius of 7 miles of the city limits. With proper facilities for transportation it would be possible for one dairy inspector to visit each of these dairies sufficiently often within a yearly period to keep a fairly good check on the methods used. This, however, would be impossible if the same inspector were required to perform city milk work in addition to dairy inspection.

There is badly needed another employee in the milk division to act as city milk inspector for the inspection of milk depots and wagons and the collection of samples of milk delivered to the customers, and to have supervision over the pasteurizing plants in the city.

It would then be advisable to resume the bacteriological examinations of the milk furnished to the city in order to determine by bacterial count the quality of the milk sold. When this can be done in a systematized way it would likewise be advisable to publish the results of the examinations in the daily papers. Milk showing more than 500,000 bacteria per cubic centimeter should not be permitted to be sold, even after pasteurization.

Because of the personal element which enters into the production of milk, and of the great danger of introducing infection through the hands of the milker, flies, or the animals from which the milk is obtained, it would seem advisable to require that all milk used in the city of Birmingham be pasteurized by the holding method, such milk to be held at a temperature of 145° for not less than 25 minutes, the pasteurizing machine to be provided with a temperature recorder and a thermoregulator. This does not mean that the efforts

to maintain cleanliness on the producing farm should be relaxed, but merely offers an additional precaution that will effectually nullify the evil effects of any accidental infection that may be introduced into the milk.

Tabulation of information relative to the milk supply of the city of Birmingham.

| | |
|--|---------------|
| Number of dairies supplying milk to the city | 180 |
| Longest haul | miles 240 |
| Shortest haul | do .2 |
| Number of dairies located within a radius of 7 miles of city | 145 |
| Daily consumption of milk | gallons 9,443 |
| Daily consumption of buttermilk | do 3,229 |
| Daily consumption of cream | do 380 |
| Number of chemical analyses made in laboratory | 1,550 |
| Number of times dairies scored | 1,045 |
| Number of dairies scored | 151 |

| Class. | Number. | Percentage. |
|----------|---------|-------------|
| 50 to 60 | 3 | 1.93 |
| 60 to 70 | 16 | 10.63 |
| 70 to 80 | 107 | 70.87 |
| 80 to 90 | 20 | 13.25 |
| Above 90 | 5 | 3.32 |
| | 151 | 100.00 |

Inspection of Meat and Other Food.

Meat inspection.—There are two men engaged in the inspection of meat, one of whom is a veterinarian, who makes the necessary ante and post mortem inspections of animals killed in the two local slaughterhouses. The other inspector passes upon imported meats from animals that have been killed under Federal supervision in slaughterhouses located elsewhere.

A number of animals are slaughtered—a few at a time—by farmers and others outside of the city limits and the carcasses brought into the city for sale. This meat must be inspected. It would be wise to arrange by ordinance to prohibit this procedure and to require that all such animals be slaughtered at one of the regular slaughterhouses, so that they can be given a thorough ante and post mortem inspection. An adequate inspection is not feasible under the present arrangement.

Other foods.—There are two inspectors engaged in the inspection of foods other than meat and milk, and in the inspection of restaurants, bakeries, confectioneries, or other place where food is manufactured or sold. Adequate ordinances to cover the subject have been enacted.

This class of work is comparatively new in the city of Birmingham, but has already produced some excellent results in improving sanitary conditions. All such places are scored, similar cards being

used in each instance. This seems to be a simple and satisfactory procedure. The scores are published monthly.

HEALTH SUPERVISION OF SCHOOLS.

The health supervision of schools is carried on by the board of education.

There are engaged in the work one physician, who receives \$1,500 a year for his services, and others who are employed temporarily at the beginning of the school year to make the necessary examinations.

In addition there are also employed two nurses, who work during the school term. One of these nurses is colored and works in the colored schools.

At the beginning of the school year an intensive inspection is held of all school children who are enrolled. This has for its purpose primarily the detection of communicable diseases, including such conditions as diphtheria, scabies, pediculosis, etc. During this inspection swabbings are taken from the throats and noses of all children who show evidence of having any inflammatory reaction or discharge from the nose or throat. Following this inspection, the work is more especially concerned with detecting those physical defects that are known to retard the advancement of the child during its school life. Attention is also given to the condition of the environment.

The school nurses are engaged in work similar to that of school nurses elsewhere—following up children who have been found defective in the school, by visits to the homes, in an effort to induce the parents to have the defect corrected, at the same time acting as educators to improve sanitary conditions in and about the homes.

EXPENDITURES AND APPROPRIATIONS.

There was expended during the year 1915 the sum of \$28,005.22.

There has been appropriated to the health department for the year 1916 the sum of \$20,250.

The income of the city from all sources during the year 1915 was \$1,838,392, of which \$943,423 was obtained through general taxation.

The amount which is available to the city government to defray its ordinary maintenance expenses for the year 1916 is \$919,398. This sum represents the total income minus certain funds which are required to pay the interest on bonds, etc.

Computing the amount that should be appropriated to the health department on a basis of 5 per cent of the total available revenues, there should be allowed for public-health purposes the sum of \$45,000, as against \$20,250, the amount actually received by the

health department to carry on its work during the year 1916. This latter figure represents but 2.2 per cent of the total available revenues.

As a comparison it may be stated that there has been appropriated for the year 1916 to the fire department \$192,180, or 20.9 per cent; to the police department, \$141,210, or 15.3 per cent; to public schools, \$248,000, or 26.9 per cent. In addition to the latter amount appropriated to the public schools, there is also received \$242,760 from the State and county and \$50,000 from fees charged to pupils. Thus, there is a total of \$541,000 available for public-school purposes.

In asking for an increase in appropriation for the health department it need not be inferred that an increase in the tax levy is necessarily required. All that is suggested is a more equal and equitable distribution of revenues at the time they are apportioned to the various departments.

In addition to the sum of \$45,000 for public-health purposes, there should be allowed for the collection of garbage and rubbish not less than 10 per cent of the city's revenues, which in the case of Birmingham would approximate \$91,939. This amount should be sufficient to enable the city to collect and dispose of all garbage and other refuse in an efficient manner.

RECOMMENDATIONS.

As a result of the foregoing study, and after careful consideration of conditions, certain definite conclusions have been reached which have been made the basis for the following recommendations:

1. That a full-time physician skilled in the science of preventive medicine be appointed in the dual capacity of health officer for the county and for the municipalities within the county; that he hold office during efficiency, and that he receive a salary of not less than \$3,500 per annum, to be paid by the county; that he be required to perform all of the executive and administrative work, and such field work as may be necessary to supervise the operations of his department.

2. That the health organization over which the above-named official shall preside be divided into two subdepartments—the department of health for the city of Birmingham and the department of health for the county of Jefferson, including all other municipalities.

3. That there be appointed a full-time assistant physician skilled in the science of preventive medicine, who shall be located in the city of Birmingham, and who shall hold office during efficiency and receive a salary of not less than \$2,500 per annum, to be paid by the city of Birmingham, and that his duties be concerned with the field activities being carried on by the health department of the city.

4. That there be appointed a full-time assistant physician, skilled in the science of preventive medicine, who shall be located in the county of Jefferson and who shall hold office during efficiency and receive a salary of not less than \$2,500 per annum, to be paid by the county. That his duties be concerned with the field activities being carried on by the health department of the county.

5. That there be appointed as an assistant to the county and municipal health officer, for work both in the county and the cities, a full-time sanitary engineer, who shall receive a salary of not less than \$2,000 per annum, to be paid from county funds, and who shall hold office during efficiency.

6. That there be installed and maintained by the county a well-equipped laboratory by transfer of the present city laboratory to the county health organization, and that the facilities of this laboratory be made available to the physicians and health officers of the entire county.

7. That there be employed for work in the laboratory a full-time bacteriologist at \$2,100 per annum. This figure is mentioned because it is the salary of the present bacteriologist, who has occupied the position for 10 years.

8. That the laboratory staff be increased by the addition of one laboratory attendant at a salary of \$840 per annum.

9. That the city of Bessemer set aside \$5,000 to defray the expenses of a health organization, to include a full-time assistant health officer trained in sanitary science, a sanitary inspector and two public-health nurses.

10. That the county of Jefferson, exclusive of the cities of Birmingham and Bessemer, be divided into five districts; that in each there be placed a public-health nurse and a sanitary inspector; that each nurse receive not less than \$75 per month and each inspector not less than \$80 per month, together with the necessary traveling expenses; that the salaries and expenses of this force be paid by the county.

That adequate transportation be furnished to the field employees of the county in the shape of inexpensive two-passenger automobiles or motorcycles, thus making it possible to cover the territory adequately, economically, and effectively.

11. That as soon as the organization in the county is completed, a sanitary station to include a portable laboratory be opened in each district consecutively from which to carry on intensive work looking toward the eradication of malaria, typhoid fever, hookworm, pellagra, tuberculosis, etc., and that at the same time an energetic educational campaign be entered into including lectures with lantern slides, demonstrations, etc.

12. That pupils of public and private schools in the county and the municipalities be required to be successfully vaccinated against smallpox before admission.

13. That not less than \$30,870 be appropriated by the county for the support of the county health department, to be expended approximately as follows:

| | |
|--|---------------|
| 1 county health officer and health officer for the cities, not less than_____ | \$3, 500 |
| 1 assistant health officer for county, not less than_____ | 2, 500 |
| 1 sanitary engineer, not less than_____ | 2, 000 |
| 1 clerk and registrar_____ | 1, 200 |
| 5 public health nurses at \$75 per month_____ | 4, 500 |
| 5 sanitary inspectors at \$80 per month_____ | 4, 800 |
| 1 bacteriologist_____ | 2, 100 |
| 1 laborartory attendant_____ | 840 |
| | <hr/> 21, 440 |
| Transportation, lanterns and slides, office and laboratory supplies, printing, etc._____ | 9, 430 |
| | <hr/> 30, 870 |

14. That the salaries for the new positions mentioned herein be considered as minimum salaries and increased from time to time, in the judgment of the board of health, after the official concerned has demonstrated his efficiency.

15. That for purposes of administration the health department of the city of Birmingham be divided into four parts—a division of epidemiology, a division of sanitation, a division of milk and food inspection, and a division of vital statistics.

16. That the assistant health officer located in the city of Birmingham be placed in immediate control of the division of epidemiology.

17. That the activities of the division of epidemiology be made to include all epidemiological work and all work in which the public health nurses are engaged, namely, the activities concerned with communicable-disease nursing, child welfare, and prenatal work, and school nursing.

18. That at least one infant welfare station and one antituberculosis dispensary be operated by the health department.

19. That the assistant health officer of the city of Birmingham be required to render the necessary professional services at the child-welfare station and antituberculosis dispensary.

20. That the nursing force of the health department of the city of Birmingham be increased to 10 nurses, whose duties shall be those concerned with prenatal and child-welfare work, communicable-disease nursing, including antituberculosis activities, and school nursing.

That all public health nursing of this nature now carried on by other bodies be discontinued.

21. That the city be divided into 10 districts, and that in each district there be placed a public-health nurse to perform within that district all of the duties required of such an official.

22. That the work of the milk and food division be made to include all of the work required in the control of the food supply, including the inspection of dairies, milk, meats, and other foods, restaurants, bakeries, etc.

23. That a chief of the division of milk and foods be appointed at a salary of not less than \$1,500 to hold office during efficiency.

24. That in order to more adequately control the milk supply of the city of Birmingham, an additional milk inspector be employed.

25. That all milk supplied to the city of Birmingham be pasteurized.

26. That all meats used in Birmingham be obtained from animals slaughtered at a central point located within the city, or from animals slaughtered under United States Government supervision.

27. That all physicians of the city and county cooperate with the health department in promptly reporting the notifiable diseases under their care, as well as births and deaths.

28. That sewers be extended to all parts of the city, and that householders on a sewer line be compelled to connect without delay.

29. That all insanitary privies be abolished, and where no sewer is available that a sanitary closet be installed.

30. That the work of the sanitary inspectors be especially directed against the abolition of the insanitary closet, the elimination of surface wells, the prevention of fly breeding through the proper disposal of manure, and the requirement that all householders be provided with proper garbage tins.

31. That a survey be made of the mosquito-breeding centers of the city, and that where filling or draining is not possible an emergency oiling squad be employed during the mosquito-breeding season and placed under the charge of a sanitary inspector.

32. That adequate housing ordinances be adopted in order that the overcrowded conditions so common in many cities may be avoided.

33. That the present police force of the city be required to cooperate with the sanitary inspectors of the health department in noting and remedying insanitary conditions, and that until the insanitary privy has been abolished the present arrangement whereby six policemen are detailed for work in the health department be continued.

34. That weekly public-health articles of an educational nature be published by the health department in the newspapers of the city, and that these articles be issued in printed form and used as the

weekly lesson in the public schools, a copy of the lesson to be given each child to take home.

35. That all of the ordinances relating to public health be gathered together and published in pamphlet form for the use of the employees of the department and others concerned.

36. That rules governing the operations of the health department be published for the information of the employees carrying out such operations.

37. That the ordinances relative to refuse be amended so that garbage alone will be kept in one receptacle, made of metal, water-tight, and with a tight-fitting lid, and that another receptacle be provided for rubbish, including ashes, paper, bottles, cans, etc.

38. That the number of wagons used in the collection of refuse be increased so that it will be possible in addition to the daily collection in the congested district to make a collection of garbage in the residential sections at least twice a week.

39. That the type of refuse wagon be such that it may be used for rubbish and garbage alternately.

40. That all garbage be incinerated.

41. That rubbish be used for filling in low-lying, mosquito-breeding areas.

42. That an amount not less than \$45,000 be appropriated by the city commission annually to defray the expenses of the health department, this sum to be spent approximately as follows:

| | |
|--|----------|
| 1 assistant health officer..... | \$2, 500 |
| 1 registrar of vital statistics..... | 960 |
| 1 clerk..... | 840 |
| 1 chief sanitary inspector..... | 1, 800 |
| 7 assistant sanitary inspectors, at \$960..... | 6, 720 |
| 1 chief of milk and food division..... | 1, 500 |
| 1 assistant milk inspector..... | 1, 140 |
| 1 assistant milk inspector..... | 960 |
| 1 meat inspector..... | 1, 140 |
| 1 meat inspector..... | 960 |
| 2 food inspectors, at \$900..... | 1, 800 |
| 10 public-health nurses, at \$900..... | 9, 000 |
| | <hr/> |
| | 29, 320 |
| Printing transportation, emergency services, supplies, maintenance, of dispensaries. etc..... | 15, 680 |
| | <hr/> |
| | 45, 000 |

43. That health officers not be required to perform the work of city or county physician or police surgeon.

44. That the accounts be kept so that the executive officer can determine without delay the cost of operating his department at any time, or the cost of any activity being carried on by his department.

45. That all officials employed in the health department after its reorganization receive at first a probationary appointment only, in order to determine personality and qualifications for public-health work before giving them a permanent position.

46. That the city of Birmingham construct a hospital in which to isolate persons suffering with communicable diseases, with the exception of tuberculosis, such hospital to contain not less than 30 beds.

47. That the county of Jefferson construct, as soon as possible, a sanatorium in which to isolate open cases of tuberculosis. Such hospital to contain not less than 100 beds.

48. That the necessary laws be enacted authorizing the health officer to isolate cases of communicable diseases in hospital when in his opinion it is advisable.





UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION
IN COLORADO

BY

CARROLL FOX

Surgeon, United States Public Health Service

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PUBLIC HEALTH ADMINISTRATION IN COLORADO.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of public health organization and administration in the State of Colorado, carried on through a period of approximately two months from September 19, 1916, to November 23, 1916.

Colorado has an area of 103,948 square miles, contains 63 counties, and has a population, estimated as of July 1, 1916, of 962,060.

The State is traversed from north to south by a part of the range of the Rocky Mountains, so that much of its territory is at a high elevation, Denver, the principal city, having an altitude of 5,183 feet. It is only in the extreme eastern portion of the State that the elevation falls below 5,000 feet.

The climate is dry and particularly beneficial in the treatment of pulmonary complaints, especially pulmonary tuberculosis.

The principal industries of the State are cattle raising, mining, and farming in the irrigated districts as well as some dry farming. Denver and Pueblo are the manufacturing centers of the State.

For information and assistance obtained during the study, the writer is indebted to the officials of the State board of health as well as to other State and local officials.

STATE BOARD OF HEALTH.

Composition of the board.—The State Board of Health of Colorado consists of nine members appointed by the Governor, the term of office of three expiring every two years. Every two years the board elects from among its members a president, a secretary, and a treasurer.

Meetings.—The board is required to meet at least semiannually at Denver, and at such other places and times as it may deem expedient. By authority of by-laws which it has adopted the board meets once each month at the call of the president.

Salaries and expenses.—The members of the board of health, with the exception of the secretary, receive no salary, but are entitled to remuneration for actual expenses incurred while traveling on official business.

Powers and duties.—The powers and duties of the State board of health are:

To have general supervision over the interests of health and life of the citizens of the State.

¹ Reprint from the Public Health Reports, vol. 31, No. 52, Dec. 29, 1916, pp. 3485-3520.

To study the vital statistics of the State and make profitable use of the collected records.

To study the influence of climate on disease and health in different localities of the State.

To make sanitary investigation and inquiries regarding causes of disease, and the effect on the health of the people of localities, employment, conditions, ingesta, habits, and circumstances.

To advise with other officials in regard to the location, drainage, water supply, disposal of excreta, and the heating and ventilation of any public building.

To recommend from time to time standard works on subjects of hygiene to be used in the schools of the State.

To license hospitals, lying-in hospitals, dispensaries, or other institutions for the treatment and care of the sick and injured.

To furnish suitable blanks to local authorities and physicians on which to make reports required by the State board of health or by law.

To call on local executives to appoint persons to serve as local health officers, the local health officer to act in cooperation with and under the advice of the State board of health.

To assume all powers conferred upon the local board of health when such board fails or refuses to act in matters concerning public health or to bring suit against the local health authorities for neglect of duty. The expense involved must be borne by the locality.

To prevent the introduction into the State of cholera or other dangerous disease by establishing a system of inspections for the purpose of determining the presence of such disease in immigrants or travelers, wearing apparel, etc. The inspector so appointed is authorized to administer oaths, and under the authority of the State board of health may order the disinfection of baggage and may isolate persons suspected of carrying infection by placing them in care of local boards of health or by using other practical methods.

To make and publish the necessary rules for the conduct of inspections. Any person violating these rules is liable to a fine of not less than \$25 nor more than \$300 for every offense.

To make the necessary by-laws and regulations for its own government. Any member who fails to obey such regulations is subject to removal on a vote of a majority of the members of the board. The office is then declared vacant by the governor, who appoints another person to the vacancy.

The secretary of state is required to provide a suitable office for the board of health and its secretary and the necessary stationery and printing.

Duties of the secretary.—The secretary of the board is required to keep his office in Denver and to perform all duties prescribed by law

or required by the board of health. In part, these require him to keep a record of the transactions of the board; to have custody of all books, papers, or other documents belonging to the board; to communicate with other State boards of health and with local boards within the State; to file all reports and correspondence; to prepare and forward such blank forms of returns as may be required; to collect and disseminate information among the people by annual report or otherwise.

Personnel.—The personnel of the State health organization (exclusive of the members of the board), with their respective salaries, is at present as follows:

| | |
|--|----------|
| Secretary State board of health (part time)..... | \$1, 000 |
| Medical inspector (part time)..... | 900 |
| Bacteriologist (part time)..... | 1, 500 |
| Clerk, vital statistics..... | 1, 200 |
| Assistant statistician..... | 1, 200 |
| Transcribing clerk..... | 1, 200 |
| Commissioner of pure food..... | 2, 000 |
| Drug inspector..... | 1, 500 |
| Food inspectors (three), at \$1,200..... | 3, 600 |
| Clerk and stenographer..... | 1, 200 |
| | <hr/> |
| | 15, 300 |

Office hours.—The office hours of the State board of health are from 9 a. m. to 5 p. m., with one hour for lunch. During Saturday afternoons there is but one employee on duty, and on Sundays and holidays the office is closed.

Requisitions, vouchers, and files.—The State board of health has little authority over its expenditures. Before any expense can be incurred, even for traveling, permission must be obtained from a majority of the members of the auditing board, which is composed of the governor, State treasurer, State auditor, secretary of state, and the attorney general.

In the case of traveling expenses, requisitions are made out at the beginning of each month for the probable sum to be needed and approval is obtained to expend not to exceed that amount.

When articles are to be purchased from the incidental fund, requisitions are addressed to the secretary of state and vouchers are made out in his office. When the purchase involves printing or stationery, the requisition must be approved by the commissioner of printing before it goes to the auditing board. In such cases vouchers are likewise made out in the office of the secretary of state.

In the case of traveling expenses, salaries, or expenses to be paid out of the "Laboratory Fund," requisitions are returned to the State board of health after approval by the auditing board, and vouchers made out in the office of the board of health for transmission to the auditor.

The scheme of filing letters is somewhat antiquated and should be changed to conform to a modern system.

Discussion.—The secretary of the State board of health is a part-time official and is elected by the board from among its members. As secretary he retains his membership on the board. As a member of the board he is appointed by the governor for a term of six years, at the expiration of which he may, for political reasons, fail of reappointment, and the board may lose a good secretary. The law should therefore be amended to provide for this contingency. An executive officer of a State board of health or State health officer should hold his position so long as he continues to render efficient service to the State.

The health officer should also be placed on a full-time basis and should receive a salary which would be commensurate with the importance of his duties and relieve him of the necessity of engaging in the private practice of medicine in order to gain a livelihood. Experience has shown that the work of a health officer and the practice of medicine are incompatible. A man can not serve his government and his patients and do justice to either.

In addition to the above it is necessary for reasons of efficiency and ease of administration to organize within the State board of health certain divisions to carry on specific duties, each division to be in charge of a full-time chief working under the supervision of the State health officer.

The entire personnel of the State health organization should hold office during efficiency and not be discharged on account of political considerations.

Larger quarters should be furnished in the statehouse to accommodate the State board of health,—such quarters to include space for a laboratory.

There is probably sufficient general law to accomplish all that is desired, provided the State board of health is given the money and men to carry on the work.

REGISTRATION OF BIRTHS AND DEATHS.

The law for the registration of births and deaths in the State of Colorado was enacted in 1907, and is patterned closely after the model law proposed by the United States Bureau of the Census.

This act establishes in the State board of health a bureau of vital statistics and makes the secretary of the board State registrar of births and deaths.

A registration district is defined as a city, an incorporated town, or a county exclusive of the cities and incorporated towns within its boundaries, and it is required that a local registrar be appointed in each registration district.

Provision is made for the appointment of deputy and subregistrars and for the payment of 25 cents to local registrars for each birth

or death certificate filed with the State registrar. The fees are paid by the local authorities upon the certification of the State registrar.

As the provisions of law are similar to those in many other States, a further summary is deemed unnecessary.

Registration of deaths.—During the 12 months' period ended June 30, 1916, there were registered with the State registrar 10,603 deaths, exclusive of stillbirths, making a death rate for the State of 11 per 1,000.

It is well known that many tuberculous patients visit the State for the benefit to be derived from its climate, and in order to arrive at a death rate comparable to that of most other States it would therefore seem fair to exclude deaths from tuberculosis where the disease was contracted outside of the State of Colorado. From the information contained on the death certificates it was learned that 892 deaths were registered from tuberculosis contracted elsewhere. Subtracting this figure from the total number of deaths there will remain 9,711 deaths from all causes, which gives a corrected death rate of 10 per 1,000.

In order to determine approximately whether the State is securing satisfactory death registrations, figures were computed for six of the cities of the State where it is believed that practically all, if not all, deaths are recorded. These figures, estimated as of July 1, 1916 (stillbirths excluded), are shown in the following table:

| Locality. | Population. ¹ | Total number of deaths. | Crude death rate per 1,000. | Number of deaths pulmonary tuberculosis contracted outside of State. | Number of deaths corrected from last column. | Death rate per 1,000. | Number of births. | Birth rate per 1,000. | Still births. |
|--------------------|--------------------------|-------------------------|-----------------------------|--|--|-----------------------|-------------------|-----------------------|---------------|
| Denver..... | 260,800 | 3,197 | 12.2 | 379 | 2,818 | 10.8 | 3,580 | 13.7 | 141 |
| Pueblo..... | 54,462 | 504 | 9.2 | 29 | 475 | 8.7 | 493 | 9.0 | 23 |
| Colorado Springs.. | 32,971 | 512 | 15.5 | 125 | 387 | 11.7 | 442 | 13.4 | 21 |
| Trinidad..... | 13,875 | 167 | 12.0 | 4 | 163 | 11.7 | 261 | 18.8 | 4 |
| Boulder..... | 11,669 | 159 | 13.5 | 19 | 140 | 11.9 | 169 | 14.4 | 5 |
| Greeley..... | 11,420 | 120 | 10.5 | 11 | 109 | 9.5 | 78 | 6.8 | 9 |
| Total..... | 385,197 | 4,659 | 12.0 | 567 | 4,092 | 10.6 | 5,023 | 13.0 | 203 |
| State..... | 962,060 | 10,603 | 11.0 | 892 | 9,711 | 10.0 | 13,673 | 14.2 | 522 |

¹ The calculations were based on population figures of the United States Bureau of the Census, estimated as of July 1, 1916.

It will be seen that these cities had, collectively, 4,659 deaths from all causes, making a death rate of 12 per 1,000, as against a death rate of 11 for the State as a whole.

After correcting for deaths from tuberculosis contracted outside of the State, the same cities had 4,092 deaths from all causes, giving a death rate of 10.6 per 1,000, which is about six-tenths higher than the death rate for the State as a whole after making the same correction.

It is therefore thought quite proper to assume that practically all of the deaths occurring in the State are registered.

Death certificates are indexed by the card system and bound annually.

Preventable diseases.—From information contained in the death certificates it was determined that 5,851 deaths might be classed as preventable. This figure represents 55 per cent of the deaths from all causes. The following table gives this information more in detail, together with other pertinent data.

| Disease. | Number of deaths registered, all ages. | Indicated death rate per 100,000. | Number of cases reported. | Indicated fatality rate per 100 cases. | Number of deaths registered under 1 year. |
|--|--|-----------------------------------|---------------------------|--|---|
| Tuberculosis, pulmonary | 1,440 | 149.6 | 32 | ..... | 4 |
| Tuberculosis, other forms | 111 | 11.5 | 0 | ..... | 10 |
| Typhoid fever | 111 | 11.5 | 533 | 20.8 | 2 |
| Diphtheria | 44 | 4.5 | 419 | 10.5 | 2 |
| Whooping cough | 67 | 6.9 | 671 | 9.9 | 41 |
| Scarlet fever | 59 | 6.1 | 1,121 | 5.2 | 2 |
| Smallpox | 1 | ..... | 73 | 1.3 | 1 |
| Measles | 29 | 3.0 | 3,486 | .8 | 5 |
| Chicken pox | 0 | .0 | 1,138 | .0 | 0 |
| Mumps | 0 | .0 | 261 | .0 | 0 |
| Pneumonia | 1,151 | 119.6 | ..... | ..... | 202 |
| Syphilis | 96 | 9.9 | ..... | ..... | 15 |
| Influenza | 194 | 20.1 | ..... | ..... | 12 |
| Meningitis, exclusive of tubercular | 86 | 8.9 | ..... | ..... | 12 |
| Septicemia, including puerperal | 116 | 12.1 | ..... | ..... | 6 |
| Tetanus | 8 | .8 | ..... | ..... | 2 |
| Rocky Mountain spotted fever | 4 | .4 | ..... | ..... | 0 |
| Erysipelas | 43 | 4.4 | ..... | ..... | 23 |
| Diarrhea and enteritis | 309 | 32.1 | ..... | ..... | 212 |
| Other infections | 102 | 10.6 | ..... | ..... | 14 |
| Diseases and injuries due to occupation | 164 | ..... | ..... | ..... | 0 |
| Other accidents | 408 | 42.4 | ..... | ..... | 6 |
| Pellagra | 3 | ..... | ..... | ..... | 0 |
| Scurvy | 1 | ..... | ..... | ..... | 1 |
| Malignant growths | 516 | 53.6 | ..... | ..... | 0 |
| Premature births | 386 | ..... | ..... | ..... | 386 |
| Congenital debility, inanition, convulsions, etc. | 115 | ..... | ..... | ..... | 115 |
| Other causes peculiar to early infancy | 287 | ..... | ..... | ..... | 287 |
| Total | 5,851 | ..... | ..... | ..... | 1,360 |

Infant mortality.—There were recorded in the State board of health during the same period 1,360 deaths of infants under 1 year of age, practically all of which may be classed as preventable. This figure represents 23 per cent of the total preventable deaths and gives an indicated infant mortality rate for the State of 99.4 per 1,000 births. This infant mortality rate, however, is not the true rate and would be lowered by securing more adequate birth returns.

Registration of births.—There were registered with the State registrar during the 12 months' period ended June 30, 1916, 13,673 births, making a birth rate of 14.2 per 1,000. It is hardly likely that this figure represents the true birth rate of the State. It indicates rather that there are a number of births occurring which are not reported—a supposition borne out by information obtained from several localities during the course of this study. It must be stated, however, that more recently an improvement has been noted as regards the number of births reported. This is due to increased correspondence and similar activity in the office during the last few

months. When the State board of health is provided with adequate means to carry its activities into the field, a very material increase in birth returns may be expected.

Birth certificates are bound annually but not indexed.

EPIDEMIOLOGICAL ACTIVITIES.

There are engaged in the epidemiological activities of the State board of health a medical inspector and a bacteriologist.

The medical inspector is a part-time official, the salary allowed by law being inadequate to pay for full-time services. In addition to epidemiological work, the inspector is required to act as sanitary engineer for the State board of health.

The bacteriologist is likewise a part-time official.

Report of Diseases.

Requirements of laws.—Every physician is required to report immediately to the local board of health every case of smallpox, cholera, diphtheria, scarlet fever, or any other disease dangerous to the public health coming under his care. Such report includes the name of the disease, the name, age, sex, and address of the patient, and the name of the physician. A physician who refuses or neglects to file such report is liable to a fine of not less than \$5 nor more than \$100.

The same report is required from the householder where a disease dangerous to public health exists within the household, and if he refuses or neglects to give such notice he is liable to a fine of not to exceed \$100.

Physicians are required to report every case of tuberculosis coming under their care to the local health officer within 24 hours on blank forms furnished for the purpose by the State board of health. Similar reports are required from those in charge of hospitals or other similar institutions. The information to be contained in the reports must be as follows: Name, color, age, nativity, sex, occupation, place where last employed, present address, part of body affected, stage of disease, and the evidence on which the diagnosis of tuberculosis is based.

When any railroad conductor discovers on his train a person suffering from cholera, smallpox, diphtheria, scarlet fever, or other contagious disease, he must communicate with the railway official nearest to the point at which the case is discovered, who in turn must give the same information to the nearest member of the State board of health or local health officer.

Requirement of regulations.—Regulations of the State board of health promulgated February 7, 1916, require that the following-named diseases be reported:

| | |
|--|-------------------------------------|
| Actinomycosis. | Glanders (farcy). |
| Anthrax. | Gonococcus infection. |
| Chancroid. | Hookworm disease (uncinariasis). |
| Chicken pox (varicella). | Impetigo contagioso. |
| Cholera (Asiatic). | Leprosy. |
| Dengue. | Malaria. |
| Diphtheria. | Measles. |
| Dysentery, amebic and bacillary. | Meningitis, epidemic cerebrospinal. |
| Erysipelas. | Mumps. |
| Favus. | Ophthalmia neonatorum. |
| Foot and mouth disease (aphthous fever). | Paragonimiasis. |
| German measles. | Paratyphoid fever. |

| | |
|---------------------------------------|-------------------------------------|
| Plague. | Whooping cough (pertussis). |
| Pneumonia. | Yellow fever. |
| Poliomyelitis, acute. | Cancer. |
| Puerperal septicemia. | Pellagra. |
| Rabies (hydrophobia). | Arsenic poisoning. |
| Relapsing fever. | Brass poisoning. |
| Rocky Mountain spotted or tick fever. | Carbon dioxide poisoning. |
| Scabies (itch). | Carbon monoxide poisoning. |
| Scarlet fever. | Carbon bisulphide poisoning. |
| Septic sore throat. | Cyanide poisoning. |
| Smallpox (variola). | Dinitrobenzene poisoning. |
| Syphilis. | Illuminating or fuel gas poisoning. |
| Tetanus. | Lead poisoning. |
| Trachoma. | Mercury poisoning. |
| Trichinosis. | Naphtha poisoning. |
| Tuberculosis. | Poisoning by nitric-oxide fumes. |
| Typhoid fever. | Silver poisoning. |
| Typhus fever (Brill's disease). | Wood-alcohol poisoning. |

In addition to the above a regulation provides more specifically for the reporting of diseases by physicians and by others when no physician is in attendance. The latter includes superintendents of hospitals, sanitariums, dispensaries and other institutions, nurses, midwives, teachers, dairy managers, heads of households and keepers of hotels or boarding houses, etc.

A regulation also requires that local health officers make a copy of the morbidity reports received by them and forward the originals to the State board of health without delay.

Methods of procedure.—A form has been devised on which to report diseases in accordance with the regulations and which at the same time serves to record a brief epidemiological history of the case. Upon the receipt of a report the information is transcribed into loose-leaf ledger and then filed. At the end of the year this information is tabulated and published in the annual bulletin.

The form of the morbidity report differs from the forms used in other States in that it is not post card size and must be inclosed in an envelope for transmission. It now has a wide distribution among the doctors of the State and should be productive of good results as regards the reporting of diseases. In fact, even in the brief space of time during which the regulations have been in effect and the new form in use, there has been a decided improvement in the reports.

Control of Diseases.

Requirements of laws.—In addition to the laws specifying the powers and duties of the State board of health which have already been summarized, and those laws pertaining especially to the powers and duties of local authorities which will be summarized later, the following provisions of law relate to the control of diseases by State authorities.

In the case of suspected tuberculosis, local health officers are authorized to make microscopical examinations of sputum or other

discharges for practicing physicians, specimens to be submitted in packages supplied by the State board of health and to be accompanied by blank forms filled out with certain necessary data. The paragraph of the act containing this provision ends in the clause, "provided that the examination provided for in this section" shall be by the State board of health.

The local health officer is required to record the information contained in a report of tuberculosis, together with the results of examination for tubercle bacilli, in a register furnished by the State board of health. A copy of this register must be transmitted quarterly to the State board of health. The register is not open to inspection except by the health authorities of the State or of the locality.

When any apartment has been vacated by a patient suffering from open¹ tuberculosis, either by death or removal, the health officer must be notified and the apartment must be disinfected, cleansed, or renovated before it may be reoccupied.

When the directions of the local health officer are not obeyed within 72 hours, a notice must be placed on the door of the infected apartment or premises, containing the information that tuberculosis is a communicable disease and that the apartment has been occupied by a case of tuberculosis and can not be reoccupied until the order of the health authorities has been complied with.

Any tuberculous person who, after being properly notified by the health officer, disposes of his discharges in a way to jeopardize the life or health of others, is guilty of a misdemeanor.

Physicians attending patients suffering from tuberculosis are required to take all necessary precautions and to give the necessary instructions to prevent the spread of the disease. Where no physician is in attendance, such duties devolve upon the local health officer.

When a report of tuberculosis has been received, the local health officer is required to transmit to the attending physician a circular of information relative to the prevention and spread of the disease.

A physician who fails to report a case of tuberculosis, or who reports as afflicted with tuberculosis any person who is not so afflicted, or who willfully makes false statements relative to a case of tuberculosis, or as to the precaution taken to prevent the spread of the disease, is liable to fine of not more than \$100.

Physicians are required to report the recovery of all cases of tuberculosis to the local health officer, who must record the same in the records of his office.

Any person violating any of these provisions is liable to a fine of not less than \$5 nor more than \$100.

Whenever a case of cholera or smallpox is suspected to exist on any train, the conductor must have it detained at the nearest station

¹ An open case of tuberculosis is defined as one in which tubercle bacilli are found in the discharges.

until the health authorities arrive to take charge of the case. The State board of health is authorized to order detention of any train or car for the purpose of making inspections.

The use of the common drinking cup in all hotels, sanitariums, theaters, public halls, schoolhouses, etc., or other institutions or conveyances frequented by the public is prohibited. A fine of not less than \$5 nor more than \$200 is provided.

In the case of an outbreak of a dangerous communicable disease in an institution, the commissioners may cause the removal of the inmates to places of security until the danger is past, when they must be returned.

Before any rags or other dangerous material may be sold or manufactured into articles to be sold, they must be disinfected. Such articles imported into the State and suspected of being infected must not be opened until they can be subjected to immediate disinfection. The State board of health is authorized to prohibit the importation of such materials.

The governor is authorized, when necessary, to draw from the general fund an amount not to exceed \$5,000 to be used by the State board of health in the control of cholera or other communicable disease dangerous to the public health.

Requirements of regulations.—The regulations of the State board of health adopted February 7, 1916, specify the methods to be used in preventing the spread of all of the communicable diseases required to be reported. These regulations are for the most part full and thorough and furnish an excellent guide to local health officers in handling the transmissible maladies. The tabulation shows briefly the methods to be used in controlling those diseases more commonly encountered.

In addition to the above the regulations also provide for the methods to be used by embalmers in handling bodies dead of communicable diseases, prohibit the removal of patients suffering from communicable disease without permission of the local health officer, or the removal of infected clothes or other articles without disinfection and the consent of the health officer; prohibit public funerals in the case of bodies dead of certain diseases; require the reporting of diseases in domestic animals which may be transmitted to man; specify the card to be used in placarding houses; prescribe disinfection and disinfectants; provide for the sanitation of hospitals, sanatoria, lying-in hospitals, and other similar institutions, and the sanitation of barber shops, laundries, and cleaning establishments; regulate the sale of second-hand goods, rags, etc.; provide for the sanitation of public conveyances, etc.

Methods of procedure.—In addition to a large amount of executive work performed through correspondence in assisting local health officers to handle certain situations, there is required a great deal of

field work of which a part only can be attempted. This is due partly to the lack of adequate funds to defray traveling expenses and partly to an appropriation inadequate to pay the salary of a medical inspector for full-time services.

Notwithstanding this handicap, the part-time medical inspector was enabled to make 51 inspection trips during the 12 months' period ended June 30, 1916. For reasons of economy, visits are made to communities only when an emergency arises or at the urgent request of local authorities. Then the opportunity is taken to attend to as many matters as possible. During these trips of inspection the following investigations were made and duties performed on account of:

| | |
|------------------------------------|----|
| Typhoid fever..... | 5 |
| Smallpox..... | 5 |
| Diphtheria..... | 1 |
| Scarlet fever..... | 5 |
| Other diseases..... | 4 |
| Water supplies..... | 7 |
| Disposal of sewage..... | 9 |
| Disposal of industrial wastes..... | 3 |
| Institutions inspected..... | 36 |
| Addresses delivered..... | 6 |
| Nuisances..... | 3 |
| Sanitary surveys..... | 6 |

In addition to the above there were 42 institutions inspected in the city of Denver.

Occasionally it is necessary to require a food inspector to make an inspection concerning matters not related to his regular work. This is done to save the expense of sending the medical inspector to a locality where the food inspector happens to be engaged in his legitimate duties.

After each inspection trip a report is made concerning the subjects under investigation and the action taken in each case.

Tuberculosis.—During the 12 months period ended June 30, 1916, there were registered with the State registrar 1,440 deaths from pulmonary tuberculosis, making a death rate of 149.6 per 100,000. Information contained on the death certificates indicates that of the above deaths 892 occurred in persons who contracted their infection outside of the State of Colorado and who had come to the State to be cured. Making the necessary correction there is therefore a death rate among those contracting the disease within the State of only 56.9 per 100,000, while a similar calculation for nonresidents gives a death rate from tuberculosis of 92.7 per 100,000. It is realized that statistics based on information contained in a death certificate are not always to be relied upon. Nevertheless it is thought that the above figures are a close approximation to the truth and bear out the facts as they are understood by persons in the State best qualified to know.

Tabulation of methods used in the control of the more common communicable diseases.

| | To be reported. | To be placarded. | Isolation of patient. | Quarantine of contacts. | Exclusion from school of contacts. | Terminal disinfection required. | Special precautions. |
|--------------------|-----------------|------------------|---|---|---|---------------------------------|---|
| Diphtheria..... | Yes..... | Yes..... | Yes; for at least 21 days, or until two successive negative cultures are obtained after 14 days' isolation. | Adults may be permitted to carry on vocation if they do not come in contact with patient. | If shown to be immune by Schick test and throat cultures are negative, may be permitted to attend school. If not immune may attend after receiving immunizing dose of antitoxin and 10 days' observation. | Yes..... | |
| Scarlet fever..... | Yes..... | Yes..... | Yes; for 35 days, or until all discharges have ceased. | Same as above and provided they do not come in contact with children or handle foods. | May be permitted to attend school, if immune, removed from house under quarantine and after 10 days' observation. | Yes..... | |
| Smallpox..... | Yes..... | No..... | In hospital if practicable for at least 3 weeks and until 10 days after exfoliation is complete. | Yes; for 14 days if not immune by reason of previous attack or recent successful vaccination or immediate vaccination and disinfection. | Yes; until 14 days from date of exposure. | Yes..... | |
| Chicken-pox..... | Yes..... | Yes..... | Until exfoliation is complete. | Not if immune and do not come in contact with patient. | Not if immune and do not come in contact with patient. | Cleansing and airing. | |
| Measles..... | Yes..... | Yes..... | For at least two weeks..... | Heads of families may come and go provided they do not come in contact with patient. | Not if immune and they do not come in contact with patient. |do..... | |
| Typhoid fever.. | Yes..... | Yes..... | Yes..... | None; but no contact permitted to engage in work where food and drink is handled. | No..... |do..... | Disinfection of all discharges and strict personal cleanliness. Screening. Vaccination advised. |

In addition to the above there were reported 111 deaths from tuberculosis other than pulmonary, making a death rate from tuberculosis, all forms, of 161.2 per 100,000.

The number of cases of tuberculosis is unknown. Morbidity reports on the subject are woefully lacking. Recently there has been some increase in the number of reported cases, but the majority of such reports have been received from nurses engaged in antituberculosis work. As regards the reporting of this as well as of other diseases, physicians frequently fail to realize their obligation to the State or the necessity of obeying laws or regulations.

Except for the county hospitals and the poor farms, there are no State or local governmental institutions for the isolation of tuberculosis. There are, however, many private hospitals, sanatoria, or boarding houses where those suffering from that disease may remain if able to pay, and there are other institutions maintained by private charity. The State of Colorado does not wish to bar the tuberculous from its territory. Many of her useful citizens were once tuberculous, and if the tuberculosis problem in the State were one of public health only, it would give rise to no special concern. The serious problem arises when, to the public health aspect of the question, is added one of economics. From this standpoint, tuberculous immigrants may be divided into several classes, those having adequate funds or whose care is guaranteed; those who upon arrival in the State must secure employment, and those who, with or without means, arrive in the last stage of tuberculosis expecting to be cured in some miraculous fashion. In any case patients may or may not be accompanied by families dependent upon them.

When the nature of the employment requires the tuberculous wage earner to remain indoors, as in office work, he is not placed in the most desirable position to effect a cure, even in Colorado, and it is very probable that he would be as well off, if not better off, in his home town with friends and relatives. In this, as well as in the case of advanced tuberculosis, the death of the wage earner is liable to leave the family without support. It then becomes a charge on public or private philanthropy. Thus the community is obliged to support a family with which it is no way concerned except upon the principle that we must be kind to the "stranger within our gates." Here it may be stated that indigents in the advanced stage of tuberculosis not infrequently come to Colorado upon the advice of a physician. In giving such advice the physician is not just either to the patient or to the State of Colorado.

While it is true that the climate of Colorado is beneficial in tuberculosis, it is equally true that tuberculosis may be cured in any climate with plenty of fresh air and food of the right kind. That the disease is transmitted directly from the sick to the well; that after

it is clinically demonstrable it is associated with a case fatality rate of not less than 10 per cent, and that it is present at all times in epidemic form must be conceded. It should, therefore, be handled as are other dangerous communicable diseases—namely, by isolation of the patient. To accomplish this it behooves every State, and counties in every State, to erect suitable buildings for the isolation of open cases of tuberculosis. Any plan to hasten the erection of such institutions is to be desired, and when they are provided it is not unlikely that in the majority of instances the tuberculous with a small or no income would prefer to make use of their county sanatoria rather than to become strangers in a strange land.

In time the State of Colorado and its counties must take part in a scheme contemplating a multiplicity of sanatoria if only to isolate those cases of tuberculosis occurring among its own citizens. For the present, the State is probably justified in not taking an action that might encourage an increase in the number of indigent tuberculous immigrants.

Typhoid fever.—During the 12 months' period ended June 30, 1916, there were reported to the State board of health 533 cases of typhoid fever with 111 deaths. The indicated death rate per 100,000 population is 11.5. The indicated case fatality rate is 20.8. This figure indicates that a number of cases of typhoid fever are not reported, not recognized, or concealed.

Diphtheria.—During the 12 months' period ended June 30, 1916, there were reported 419 cases of diphtheria with 44 deaths. The indicated death rate is therefore but 4.5 per 100,000. This is much below the average for the registration area. On the other hand, the rather high case fatality rate—namely, 10.5—would indicate that all cases are not reported or that there is a delay in the use of antitoxin. In the year 1909 the legislature appropriated to the State board of health the sum of \$5,000 for the purchase and free distribution of diphtheria antitoxin. Unfortunately no use was made of this act, and it is believed that the amount appropriated has long since reverted to the treasury. There should be some arrangement whereby antitoxin could be easily made available to the poor, payment for the serum to be made by either the State or the locality. To facilitate matters, distributing stations should be designated in various parts of the State by the State board of health.

Pneumonia.—Next to tuberculosis the greatest number of deaths occurred from pneumonia. There were 1,151 deaths, giving a death rate per 100,000 of 119.6.

Occupational diseases and accidents.—During the 12 months' period ended June 30, 1916, there were 164 deaths due to accident or disease occurring as the result of occupation. The majority of these deaths were associated with the mining industry.

Diagnostic Laboratory.

The bacteriological work for the State board of health is performed by a part-time official who is also the bacteriologist for the city of Denver. In addition he operates a private laboratory. He receives from the State a salary of \$1,500 per year. Examinations are made in the city laboratory, the State furnishing the culture media.

The bulk of the work done for the State board of health is on account of diphtheria. A few examinations have recently been performed to detect rabies in animals, and occasionally a search is made in cerebrospinal fluid for the presence of the meningococcus.

The result of an examination is reported by the bacteriologist to the attending physician, by telegraph if requested, and to the State board of health by whom the report is filed.

There are two mailing outfits in use. One, for the submission of material from the throat and nose in the case of diphtheria, consists of a sterile swab inclosed in a sterile test tube packed in an approved mailing case. These outfits are shipped by the State board of health to local health officers for distribution. The other outfit is used for transmitting water samples and is furnished by the State chemist from Boulder, Colo.

During the 12 months' period ended June 30, 1916, there was a total of 610 examinations, all made for diphtheria. Of these, 181 were positive and 429 negative. The cost of maintaining the laboratory during the same period was \$1,684.94, which makes the average cost of each examination \$2.76. Based on a total of 610 examinations and excluding Sundays, the average daily number of examinations was a little under two. This represents the examinations performed on behalf of the State board of health alone and does not include any work done for the city of Denver, for which the bacteriologist receives an additional salary from the city.

The tabulation of examinations submitted by the bacteriologist at the end of the year to the State board of health and the tabulation compiled from the records on file in the office of the secretary of the State board of health do not agree. This is because the bacteriologist has included in his yearly tabulation a few examinations of material from diphtheria suspects located in the suburbs of Denver. In such cases reports are not made to the State board of health. There were also made at the request of the city a number of examinations of swabbings from the throats of children who are to become inmates of institutions located within the city limits. A city ordinance requires this procedure. The results of such examinations are reported to the city, and the work should be credited to the city laboratory.

Local Health Authorities.

Requirements of law:—The laws relating to the formation of local boards of health and the appointment of local health officers are summarized as follows:

The board of health in cities of the first class (15,000 or more population) is comprised of the mayor, the health commissioner or city physician and a member of the city council.

The county board of health is comprised of the county commissioners and the county clerk, who acts as clerk of the board. The board of health of any city, town, or village has exclusive and independent control within its own jurisdiction.

Unless otherwise provided for, the mayor and council or the trustees of an incorporated town or city are authorized to exercise the powers and perform all the duties of boards of health within their respective jurisdictions. In such parts of the county not represented by a town or city organization, the county commissioners are empowered to act in matters of public health.

Every board of health is required to appoint one or more physicians to be the health officer or officers of the county or town, as the case may be. Such local health officer holds his office during the pleasure of the board, which also establishes his salary or other compensation. When it is not possible to secure the services of well-educated and suitable physicians, the board may appoint some other person as health officer.

A local health officer, unless otherwise provided for by law, is entitled to receive from the locality compensation at the rate of not less than \$2 per day while in the discharge of his official duties.

The following is a summary of the laws defining the powers and duties of local boards of health. The local board of health is authorized—

To promulgate regulations for the maintenance of the public health. These regulations must be advertised by publication in some local newspaper, if there be one; and if not, by posting them in five public places. Any person violating a regulation of the local board of health is liable to a fine of not to exceed \$100.

To remove any person suffering with smallpox or other sickness dangerous to public health to a separate house, if it can be done without danger to his health, and to provide nurses and other assistants, to be paid by the locality, or to quarantine such person in his home, and to take such other measures as may be necessary.

To establish one or more hospitals for the isolation of persons suffering from smallpox or other disease dangerous to the public health. All such hospitals are subject to rules and regulations of the board of health or a committee appointed by such board. It is prohibited to locate such a hospital within 100 yards of an inhabited house situated in an adjoining county without consent of that county. All employees of such hospital are subject to rules and regulations promulgated by the board of health or committee appointed by it. Any physician or other person in any hospital, jail, etc., who violates any of the regulations made for the government of the same is liable to a fine of not less than \$10 nor more than \$100.

To provide immediately, as an emergency measure, a suitable hospital building, with necessary nurses and attendants, in which to isolate any persons suffering from smallpox or other disease dangerous to the public health when such disease makes its appearance in a community.

To use all possible care to prevent the spread of communicable diseases and to give to travelers public notice of infected places.

To issue permits for the removal of any infected article or sick person when it is thought safe and proper to do so.

To make suitable provision for vaccination against smallpox, under the direction of the board of health or the health officer.

To investigate, through the local health officer, every case of smallpox, diphtheria, scarlet fever, or other contagious disease dangerous to public health reported or suspected to exist. The local health officer, on behalf of the board of health, must take prompt measures to prevent the spread of the disease—i. e., to vaccinate, isolate, placard, etc.

To establish quarantine grounds in a suitable place. Any two or more counties may join together to establish such a place for quarantining individuals. Any person violating any quarantine regulations promulgated by any local board of health under authority of law is liable to a fine of not less than \$5 and not more than \$500. Any expense incurred on account of any person or grounds under such quarantine regulations must be paid by the person or by the owner of the grounds.

To remove to some other place any person confined in a jail and suffering from any disease dangerous to the health of other inmates or individuals of the community and to keep such person until he is in a safe condition to be returned to jail. When a prisoner has been removed from a jail, a copy of the order directing him to be removed must be forwarded to the clerk of the district court.

To remove any individual of the poorhouse or hospital suffering from a dangerous contagious disease to a suitable place until such person is no longer dangerous to other individuals.

To enter any building, car, or train of cars in order to examine into causes affecting public health and if refused entrance, to make complaint to a justice of the peace, who is authorized to issue a warrant to a sheriff or constable to enter such building accompanied by any two members of the board of health between the hours of sunrise and sunset and abate any nuisance under the direction of the members of the board of health.

To disinfect baggage, clothing, or other goods suspected of being infected, or to remove the same to a safe place until they are, in the opinion of the board of health, free from infection. The authorized officer may break open any house, shop, or other place in the daytime to secure articles suspected of being infected. A reasonable charge for securing such articles, transporting and disinfecting them, must be borne by the locality.

To appoint inspectors to inspect passengers coming into the State from infected districts in other States, and if they are suspected of bringing with them any infection dangerous to the public health, to restrain their movements and direct them to return from whence they came. Any traveler disobeying the orders of the inspector is liable to a fine of not to exceed \$300.

To make regulations respecting the importation of any article liable to convey infection. Any one bringing in an unauthorized article is liable to a fine of not to exceed \$100.

To assign the location of any business detrimental to the public health. When any place or building so assigned has become dangerous to the neighborhood or travelers, the court may revoke the license.

To require, under certain conditions, the removal of any cemetery.

To examine into all nuisances, sources of filth, and causes of sickness that may be injurious to public health, and to abate, remove, or prevent such as the case may require.

To regulate the care and cleaning of privies or water-closets, or to declare that such places are nuisances and order the abatement thereof.

To order that all low-lying areas which are filthy or contain stagnant water, be filled, drained, or cleaned, or to tear down any building which is liable to fall and injure persons or property.

To abate nuisances when any person, corporation, or company neglects to do the same after the receipt of an order from the local board of health, and to recover the expense of abatement by an action of debt against the person or as a lien against the property.

To abate a nuisance when such nuisance is found on private property and the owner or occupant refuses to abate the same within 24 hours, the expense so incurred to be paid by the owner or occupant of the property. For failure to abate a nuisance within 24 hours after the order is received, a person is liable to a fine of not to exceed \$100. The law further provides for the abatement of nuisances by the court.

In addition to the above the law also make the following provisions:

The county court or any justice of the peace of any county or town has jurisdiction in matters concerning nuisances.

The justice of the peace is authorized to issue a warrant directed to any sheriff or constable requiring him, under the direction of the local board of health, to remove any person suffering from contagious disease or to take possession of the house and provide nurses, attendants, etc., for the accommodation of the sick.

Nurses and attendants employed as above are entitled to just compensation from the locality. The owners of houses are also entitled to remuneration when houses or other possessions are taken by authorized officials.

Where the nature of a business by reason of its being a nuisance may injure any person either in his comfort or in the enjoyment of his estate, he may bring an action for damages against the owners of the business.

The owner of any dead animal is required to burn or bury the carcass at least 2 feet under ground. Any other disposition is a violation of the law and subjects the owner to a fine of not less than \$10 nor more than \$30, or, in default of payment thereof, to imprisonment of not more than 30 days, or both fine and imprisonment.

It is the duty of all physicians and clerks of local boards of health to make a report of their proceedings to the State board of health and any other facts that may be required by the State board of health.

It is likewise the duty of the above persons, as well as physicians or presidents of mining or other corporations, to forward to the State board of health, upon request, any information of interest from a public-health standpoint.

A law also provides for the sale of diseased meats or other foods liable to injure the health of the people of the locality, prohibits diseased animals to run at large, and requires those engaged in selling or manufacturing for sale antitoxin, vaccines, or other pharmaceutical products to make a report to the local board of health within 12 hours, stating to whom the product was sold and the date. For failure to report there is provided a fine of not less than \$5 nor more than \$20.

For the purpose of looking superficially into local health organization and administration the following-named cities were visited:

Denver, Denver County.
Colorado Springs, El Paso County.
Pueblo, Pueblo County.
Trinidad, Las Animas County.

Boulder, Boulder County.
Fort Collins, Larimer County.
Greeley, Weld County.

The following is a brief statement of the public-health activities in these localities as well as the personnel engaged.

Denver.—The personnel consists of the head of the health department, who is also head of the department of charities and is known as “manager of health and charities.” In addition there are engaged in public health work, 1 deputy health commissioner (vacant), 1 registrar of vital statistics, 1 secretary, 1 clerk, 1 janitress, 1 medical inspector, 2 fumigators, 2 quarantine officers, 1 chief bacteriologist, 1 assistant bacteriologist, 1 chemist, 2 laboratory attendants, 1 chief of milk-inspection division, 1 creamery inspector, 1 milk-depot inspector, 2 dairy inspectors, 1 food inspector, 1 drug inspector, 7 meat inspectors, 5 dump guards, 2 police surgeons, 2 city physicians, and the employees at the county hospital, county poor farm, and isolation hospital.

Activities.—The activities carried on by the health department are chiefly concerned with the control of communicable diseases, the inspection of foods, including milk and meats, the collection of vital statistics, and the maintenance of a bacteriological and a chemical laboratory.

In the control of the milk supply, supervision is maintained over the producing farm, pasteurizing plants, depots to which milk is brought in from the surrounding counties, and creameries or plants dealing in milk and manufacturing milk products.

There are six pasteurizing plants in the city. There is no ordinance requiring the pasteurization of milk. Both the holding and the flash system are used. Milk must be sold in original packages and places selling milk must be licensed. The standard for milk is that it shall not contain more than 500,000 bacteria nor more than 10,000 colon bacilli, or 10,000 streptococci per cubic centimeter.

About 30 per cent of the cases of communicable disease occurring in the city are taken to the isolation hospital and the rest are quarantined at home. The usual methods are pursued as to placarding, fumigation, etc. In the case of diphtheria, cultures are required for diagnosis, from contacts, and for the release of quarantine. No child may return to school until the throat has been free from diphtheria bacilli for two weeks. Before a child may become an inmate of an institution a culture is taken from the throat and nose to exclude diphtheria.

The isolation hospital is built of brick on the pavilion plan and will accommodate 100 patients. It is used for the isolation of all communicable diseases, but more especially diphtheria, scarlet fever, and erysipelas. Patients suffering from tuberculosis are taken to the county hospital and the poor farm.

The inspection of foods includes the ante and post mortem examination of animals killed in local slaughterhouses not under Government supervision, and the inspection of all places handling meats or other foods.

The work of the bacteriological laboratory consists of the examination of swabs for suspected diphtheria or carriers and the examination of milk and water.

In addition to the above it may be said that there is a partial school inspection. The school authorities employ one physician but no nurse. The bulk of the examinations are made by the teachers under the authority of State law. Many pupils are referred to the city physicians of the health department for advice. The work of the city physicians is therefore of a public health as well as of a charitable nature. Many pupils of the public schools are rendered surgical and medical relief at the county hospital.

The rubbish collected in the city is used as a fill. To supervise the dumping of this material, the city health department employs five men,

Garbage is collected by private contract and after sterilization is fed to hogs. Dead animals are collected by private contract.

Sewage is emptied into the Platte River untreated. The city is well sewered and the ordinance requiring sewer connections is enforced.

The water supply is owned by a private corporation. There are four treatment plants. At one, slow sand filtration is used; at another, rapid sand filtration and hypochlorite; at another, sedimentation and chlorinization, and at another, water is filtered through galleries.

The total appropriation for the maintenance of the public health during the present year is \$66,540, with \$23,380 additional to maintain the isolation hospital. The total salary list for the health department is \$59,600, including \$11,600 for employees at the isolation hospital. The amount appropriated for the county hospital is \$170,234 and for the county poor farm \$34,420.

There are 12 inspectors employed by the city who are not in the health department and who perform not only sanitary inspections but inspections relative to fire protection, construction of buildings, plumbing, etc.

The department of health and charities also maintains a corps of "investigators," who determine the status of indigents applying for financial relief. Duties of this nature are especially necessary in Denver on account of the seriousness of the tuberculosis problem from the economic standpoint. There is also a district nurse association in Denver supported by private philanthropy.

Colorado Springs.—The personnel consists of 1 health officer, who is a part-time official and who receives a salary of \$150 per month; 1 bacteriologist and chemist, 1 clerk, 3 sanitary inspectors, 1 market inspector, 1 assistant market inspector, 1 plumbing inspector, and 1 superintendent of the garbage dump and assistant plumbing inspector.

Activities.—The activities carried on by the health department are those concerned with the control of the communicable diseases, the registration of births and deaths, the inspection of foods, including milk, the operation of a diagnostic and chemical laboratory and plumbing inspection.

The health officer is the local registrar.

Dairy inspection is carried on by the market inspector and his assistant.

In addition to the above it may be said that garbage is collected under contract, boiled, and fed to hogs.

Manure must be collected from May 1 to November 1 three times per week. It is dumped and burned.

There are two isolation hospitals—one for smallpox and another for other communicable diseases.

The water supply is obtained from a mountain stream and is untreated except by settling.

The sewage from the city passes into a creek untreated.

There is no school inspection, but a nurse is employed by the board of education, and the health department has maintained a dental clinic at which school children may receive free treatment.

There was appropriated for the health department the sum of \$14,000 for the year 1916.

Pueblo.—The personnel consists of 1 health officer, who is a part-time official and who receives a salary of \$150 per month; 1 assistant health officer, 1 bacteriologist, 1 food inspector, 2 sanitary inspectors, 1 plumbing inspector, and 1 clerk.

Activities.—The activities engaged in by the health department are concerned with the control of communicable diseases, the registration of births and deaths, the inspection of foods, including milk, restaurant inspection, plumbing inspection, rooming-house inspection, and the maintenance of a bacteriological laboratory.

The health officer is the local registrar.

The inspection of milk and dairies is carried on by the food inspector, who is a veterinarian. There is one pasteurization plant in the city, which is inspected by the health department.

There is no school inspection, but the board of education employs 2 nurses, and children with defects are referred to the health department.

In addition to the 2 school nurses, the associated charities of the city and the Colorado Fuel & Iron Co. each employs one nurse.

There is an isolation hospital for the common communicable diseases maintained in connection with a private hospital, but no hospital for the isolation of smallpox.

Garbage is collected under private contract and is fed to hogs.

The water supply is obtained from the Arkansas River and is treated by coagulation with sulphate of iron and lime, and chlorinated, and then undergoes sedimentation in five basins.

Sewage is passed into the Arkansas River untreated.

For the year 1916 the health department received \$13,500.

Trinidad.—The personnel consists of 1 health officer, who is a part-time official and receives a salary of \$60 per month. He has no assistants. There are, however, employed by the city 4 other persons who are engaged in work of a public-health nature, but who are independent of the health officer. These employees are 1 dairy inspector, 1 chemist, 1 plumbing inspector, and 1 policeman who acts as sanitary inspector.

Activities.—The health officer is local registrar and is engaged in the control of the communicable diseases. The city and county maintain a hospital for the isolation of smallpox.

Garbage is collected by the city scavenger service and fed to hogs.

Water is obtained from a mountain stream and undergoes no treatment. The watershed is owned by the city and the United States Government.

Sewage is emptied upon a ranch, untreated. There is no special appropriation for the health department.

Boulder.—The personnel consists of 1 health officer, who is a part-time official and receives \$100 per month. He has 1 assistant—a sanitary inspector, employed during the summer months only.

Activities.—The activities of the health department of the city are carried on personally by the health officer, and include the registration of births and deaths, milk inspection, a partial school inspection, and diagnostic work performed in the laboratory of the University of Colorado.

There is one nurse employed by private charity.

Garbage is collected under private contract and fed to hogs.

City water is obtained from a mountain stream and undergoes no treatment.

The sewage of the city is settled, then emptied into a creek.

The isolation hospital is owned by the University of Colorado.

The health department received \$1,800 for the year 1916.

Fort Collins.—The personnel consists of one health officer, who is a part-time official and receives a salary of \$40 per month, and one milk and dairy inspector.

Activities.—The activities carried on by the local health officer are concerned with the control of communicable diseases and the inspection of milk and dairies.

There is no isolation hospital proper, but the county furnishes a building in which to isolate smallpox.

The water supply is obtained from a mountain stream, filtered and then treated with chlorine.

Garbage is collected by the city and is fed to hogs. The city furnishes the garbage can.

Sewage is emptied into the river untreated.

Greeley.—The personnel consists of one health officer, who is a part-time official and receives a salary of \$50 per month and \$2 for each terminal disinfection; one sanitary inspector; and one medical inspector for school inspection.

Activities.—The activities carried on by the health organization of Greeley are concerned with the control of communicable disease, milk and dairy inspection, school inspection, and diagnostic work, which the health officer performs in his own laboratory.

The inspection of dairies is also made personally by the health officer.

The water supply is obtained from a mountain stream and undergoes sedimentation and filtration.

Sewage is used for irrigation in summer and in winter empties into a stream untreated.

Garbage is collected by the city and fed to hogs.

The isolation hospital is owned by the county and is used to isolate various communicable diseases.

County organization.—In each county there is a health officer, who frequently acts as county physician as well. A large part of this work is performed in connection with the office of county physician. In some counties there have also been appointed one or more assistant county health officers, located in different parts of the county.

Discussion.

The epidemiological work of a board of health is its most important function, and in order that the State board of health of Colorado may be placed in a position adequately to perform work of this nature as well as to bring it up to the standard of modern health departments, both the medical inspector and the bacteriologist should be placed on a full-time basis. There should then be organized a division of epidemiology, to be placed in charge of the medical inspector under the supervision of the State health officer.

Under the present arrangement the diagnostic laboratory is of very little utility to the State. It should be made a part of the division of epidemiology and its scope should be materially broadened and made to include the examinations necessary to determine the presence of typhoid fever, paratyphoid fever, tuberculosis, intestinal parasites, gonorrhea, and the bacteriological examination of milk and water.

The laboratory itself should be moved to the same building which houses the rest of the State board of health, so that for administrative purposes it may come directly under the supervision of the State health officer. The State board of health has in storage a certain amount of material which could be used as part of the equipment of a new laboratory. Additional equipment would be necessary and could be purchased at no great cost.

It is thought that a district health organization for the State is not necessary at this time.

In regard to tuberculosis, it would seem only fair to those States which, because of their climate, receive tuberculosis patients from all parts of the country to make some provision whereby the migration of the tuberculous would be restricted and a community made responsible for the maintenance of its own citizens afflicted with the disease. However, laws to that effect could not be enforced with justice to all concerned until other laws requiring the registration of all cases of tuberculosis were enacted and strictly enforced in all States, and until every community had the means to supervise the movements of the tuberculous by a staff of visiting nurses and to isolate open cases in local sanatoria.

PUBLIC HEALTH ENGINEERING.

Requirements of laws.—It is the duty of the State chemist to make a chemical and bacteriological analysis of water samples from town or school districts upon the request of local health officers when such water supply is suspected of being contaminated. Reports giving the results of such analyses are made to municipal health officers or other authorities concerned.

It is forbidden to pollute or obstruct any watercourse, lake, pond, marsh, or sewer so as to render same unwholesome to the locality.

For violation of this law there is provided a fine of not to exceed \$300. Every such nuisance may be abated by the sheriff.

Any person who throws into any well or open sewer any refuse from slaughterhouses, privies, garbage, etc., may be punished by a fine of not less than \$100 or more than \$500 for each offense.

A city or county is granted authority to prevent the pollution of water in any reservoir, stream, and pipes included within the boundaries of mountain parks or boulevards, as well as the source from which the water is taken as far as 10 miles above the point from which it is diverted.

Requirements of regulations.—The protection of water supplies, the proper disposal of sewage and municipal wastes, and the elimination of the house fly are all provided for by regulations. In each instance a brief discussion is given pointing out the dangers that may arise from a neglect to take the proper precautions. The methods to be pursued in the various instances are formulated in a set of rules which are advisory in nature and not mandatory. They are intended as a guide to local authorities who desire to take action. At the same time the State board of health offers its assistance in working out the best methods to be used in the different localities.

The public utilities commission has formulated a set of rules making a standard for the purity of the water furnished for human consumption by corporations, private or municipal. The rules specify that such water should be free from disease-producing organisms and injurious chemical or physical substances and should be agreeable to

the sight and smell. Water which rarely shows the presence of the bacillus coli group and which has a reasonably low bacteria count will ordinarily be considered safe.

The rules further require that the corporations must submit samples monthly to the State chemist for analysis. The result of the test must be recorded in triplicate, one copy to be furnished to the public utilities commission, one to the State board of health, and one to the corporation. Each corporation supplying water to a town of 5,000 or more inhabitants must provide suitable equipment for making tests for the presence of the colon bacillus and other bacteria, turbidity and suspended matter, and must make such tests at least once each week and report as above.

The rules require that when any test discloses the presence of the colon bacillus or a high bacteria count, the corporation must employ all reasonable means to make the water safe.

Methods of procedure.—At present the public health engineering activities of the State board of health are carried on by the medical inspector. The State chemist, who is an official of the University of Colorado, makes the necessary bacteriological and chemical examinations of water samples at the request of health authorities. This work is done in the laboratory of the University of Colorado, located at Boulder, Colo.

The table previously given shows that there were made by the medical inspector during the 12-month period ended June 30, 1916, 19 investigations on account of water supplies, sewage disposal, and trades wastes. During the same period the State chemist made an analysis of 304 samples of water. These figures were obtained from the records in the office of the State board of health.

Discussion.—The medical inspector has had some training and experience in public health engineering, but he is not a sanitary engineer, nor would a medical inspector actively engaged in epidemiological work have sufficient time to perform the duties of both offices.

It is agreed by all who have had experience that the work of a sanitary engineer has a most important bearing on the maintenance of the public health, therefore a public health engineering division in the State board of health, with a full-time sanitary engineer as its chief, could render most valuable services to the people of the State.

In order that the activities of the sanitary engineer shall be effective, he must work under a businesslike arrangement. Therefore all matters relating to the subject of public health engineering should be correlated and placed under his immediate supervision.

An important part of the work of a sanitary engineer is the analysis of water and sewage. In Colorado laboratory investigations have been taken away from the State board of health and placed with the State chemist, an official over whom the board of health has no control. Such a scheme will never prove satisfactory. A mere analysis is of little value. It is only by a proper interpretation of the results of analysis in connection with a field survey that practical use may be made of the findings, and as these matters devolve upon a

sanitary engineer he should have supervision over the laboratory in which the analyses are performed.

The sanitary engineer of the State board of health should act as the advisor to local communities in all matters relating to the water supply, the disposal of sewage, garbage, and other municipal wastes and the disposal of industrial wastes.

THE INSPECTION OF FOODS AND DRUGS.

Requirement of laws.—The laws relating to the manufacture and sale of foods and drugs conform very closely in their provisions to United States statutes and include the manufacture, sale, misbranding, and adulteration of foods and drugs, the sale of narcotic and habit forming drugs, and the maintenance of sanitation in places handling foods. These laws have been placed for their enforcement in the State board of health.

The State chemist, an official of the University of Colorado located at Boulder, is required to analyze samples of foods and drugs collected by inspectors of the food and drug division of the State board of health. The results of analysis must be transmitted by the State chemist to the pure food commissioner.

In addition to the above a law to maintain the purity of milk and milk products was passed in 1915 and placed for its enforcement in the State Agricultural College, and there is also a law to prevent the sale of meat from diseased animals and to provide for the maintenance of sanitation in slaughterhouses. This law has been placed for its enforcement in the office of the meat and slaughter plant inspector.

Requirements of regulation.—The regulations of the State board of health conform as closely as possible to those of the United States Department of Agriculture and govern the operations of those concerned in the enforcing or complying with the laws relating to foods and drugs.

Methods of procedure.—The food and drug division of the State board of health is in charge of an official designated as pure food commissioner. He has under him three food inspectors and one drug inspector. Part of the time of one clerk is given to the office of the pure food commissioner and part to the office of the secretary of the State board of health.

The inspectors are essentially field men. Their services are of maximum value when they are working in the smaller communities and away from headquarters. Unfortunately their activities in the field are limited because of an inadequate appropriation to defray travel expenses. The appropriation amounts to about \$25 per man per month, including the travel expenses of the chief of the division. Such an amount does not permit of much field work.

Samples collected by the inspectors are paid for, and, where it is thought likely prosecution will follow, are sealed. They are sent to the State chemist for analysis. The report of the analysis is sent to the food commissioner and the sample labeled and retained for future use in court.

Prosecution against violators of the food and drug law can be brought by the State only in the criminal courts, and it is difficult to arouse the interest of the prosecuting attorney unless the violation very clearly endangers the health of the people. Therefore when local ordinances, as well as State laws, are violated, the case is prosecuted before a local magistrate by the local food inspector upon evidence collected by the State inspector.

During the 12 months' period ended June 30, 1916, the inspectors of the food and drug division visited 347 towns. In these localities there were inspected 295 drug stores, 2,299 grocery and meat stores, 30 dining cars, and 2,842 miscellaneous establishments handling foods. A number of samples of foods and drugs were collected and sent to the State chemist for analysis, and a quantity of food products condemned and in some cases destroyed.

The work of the drug inspector includes a number of investigations relating to violations of the narcotic act in addition to the inspection of drug stores.

The same remarks that were made in regard to the analysis of water should be repeated here with equal emphasis as regards the analysis of foods and drugs. Such analyses should be made under the supervision of the official who is responsible for the enforcement of the food and drugs act. The food and drug laboratory should therefore be a part of the State board of health. That board could, in fact, operate such a laboratory at no greater amount than is now appropriated to the State chemist for the same purpose.

Control of milk supply.—The enforcement of the law to maintain the purity of milk and milk products has been placed for its enforcement with the State Agricultural College and not with the State board of health where it logically belongs, as the most important of all foods from the standpoint of public health.

The chief of the department of animal husbandry of the agricultural college has been made ex officio State dairy commissioner. He has not a sufficient number of inspectors, however, to exercise a supervision over the milk supply from all of its angles, and therefore he can devote special attention only to the creamery or to the products made from milk, trusting that each locality may be in a position to supervise the methods used in the production of milk and, when in need of assistance from the State, will request it. The methods used in the production of milk are the most important from the standpoint of the public health, and it is in a supervision of these

methods that the inspectors of the food and drug division of the State board of health could cooperate with those of the agricultural college, by taking over the inspection of the producing farms in all places where there was no local inspection. It would be an easy matter for an inspector of the food and drug division, while working in a locality, to extend the scope of his inspections to include producing farms in the vicinity. As the State board of health is given supervision over the life and health of the people of the State, and as the purity of the milk supply has an important bearing on public health, that board should formulate a set of rules in conformity with the State law providing for the methods to be used in the production of milk. The inspectors should receive some preliminary training relative to milk inspection and should realize that in the enforcement of milk regulations they are educators rather than police officials.

DISSEMINATION OF INFORMATION.

It has been the custom in the past for the State board of health to make a biennial report of its transactions. The last report, however, is an annual report for the year 1915. This report is an exceedingly valuable publication in that it contains a compilation of the laws of the State pertaining to the public health as well as all of the regulations of the State board of health. The preparation of this report represents an expenditure of much thought and energy, but its value more than compensates for the labor entailed.

The expense of publishing the report is paid out of a special appropriation of \$800 for the biennial period.

No bulletins of a popular educational nature are issued. A few circulars of information to health officers have been published from time to time, relating to the control of diseases, and some of the laws have been reprinted.

The medical inspector takes advantage of every opportunity to give talks on public health to pupils of the public schools in the districts where he may be carrying on some investigation, or to address other gatherings upon request. Lectures are not infrequently given by the secretary or other members of the State board of health.

The State board of health owns two moving-picture films which it loans to those communities desirous of exhibiting them.

When the State board of health has more funds it is suggested that bulletins of a popular nature be issued to be used especially in instructing the pupils of the public schools.

It would also be advisable for the State board of health to acquire a public-health exhibit to be shown in the various communities of the State, accompanied by illustrated lectures.

HEALTH SUPERVISION OF SCHOOLS.

The State board of health has neither the money nor the authority to engage in this class of work, but is cognizant of its importance, and has therefore promulgated regulations concerning the hygiene of schools. These regulations provide for the proper construction of school buildings as regards toilet facilities, heating, lighting, ventilation, water supply, seating, etc., and the care of the building, and prohibit the employment of teachers or janitors suffering from a communicable disease, especially tuberculosis or syphilis. The regulations also formulate rules to be used by local authorities in enforcing the law providing for the examination of pupils.

This law is briefly as follows:

The State superintendent of public instruction is required to provide the necessary test cards, blanks, record books, appliances, etc.

The teacher or principal of every school is required, during the first month of each year, to test the sight, hearing, and breathing of all pupils, keep a record of the same, and make a written report to the State superintendent.

Each teacher must also report any mental, moral, or physical defect, as soon as such defect is noticed, to the principal or county superintendent of schools, who in turn must notify the parents and recommend that the child be thoroughly examined and treated by a competent physician as soon as possible.

In the case of indigents the examination may be made by the county physician.

Discussion.—Any law providing for a health supervision of school children is a step in the right direction, although the one summarized above is far from ideal.

It is not the intention to recommend a district health organization for Colorado. Without such an organization the State board of health could take no active part in rural school work except in an advisory manner. It might be suggested, however, that a provision requiring school districts to employ one or more school nurses would greatly enhance the value of a system of school inspection. As mentioned above, the State board of health could do much toward educating the children of the public schools in a correct knowledge of public health matters by publishing a series of bulletins to be used in the schools as a weekly lesson in hygiene.

APPROPRIATIONS AND EXPENSES.

In compiling a tabulation of the itemized expenses of the State board of health, the 12 months' period between July 1, 1915, and June 30, 1916, has been used. This is not the fiscal year used in the State of Colorado.

The tabulation shows that during this 12 months' period the State board of health expended \$19,346.45, which is \$304 less than they are allowed for each fiscal year. It does not signify that at the end of the biennial period there will be a balance in favor of the health organi-

zation. The apparent balance indicated in the tabulation may be said to represent the money which is held in reserve for travel expenses in case of emergencies. This amount will be expended before the end of the biennial period, at which time all appropriations expire and all balances revert to the treasury.

Appropriations are made to the State board of health for a biennial period. The appropriation act specifies the purpose for which the money is to be used. For the biennial period 1915 and 1916, the act reads as follows:

| | 1915 | 1916 |
|--|------------|------------|
| Secretary State board of health..... | \$1,208.30 | \$1,000.00 |
| Traveling expenses members and inspectors..... | 750.00 | 750.00 |
| Bacteriologist..... | 1,500.00 | 1,500.00 |
| Clerk vital statistics..... | 1,200.00 | 1,200.00 |
| Clerk and stenographer..... | 1,200.00 | 1,200.00 |
| Assistant statistician..... | 1,200.00 | 1,200.00 |
| Transcribing clerk..... | 1,200.00 | 1,200.00 |
| Medical inspections..... | 900.00 | 900.00 |
| Pure food commissioner..... | 2,208.30 | 2,000.00 |
| Pure food and drug inspector..... | 1,500.00 | 1,500.00 |
| Food inspectors (three), at \$1,200..... | 3,600.00 | 3,600.00 |
| Laboratory supplies and expenses..... | 500.00 | 500.00 |
| Traveling expenses commissioner and food inspectors..... | 1,500.00 | 1,500.00 |
| Fund for bulletin..... | | 800.00 |

The total for the biennial period represents an average yearly appropriation of \$19,650 and includes the amount required to enforce the food and drug act. A glance at the tabulation shows that to support the food and drug division of the State board of health cost \$9,917.16, or a little more than twice the amount that was required to carry on all other activities of the health organization. In many States the food and drug work is supported by special appropriation and therefore does not come out of the funds for strictly public health purposes.

The assessed valuation of taxable property in 1915 was \$1,249,199,210. Believing this figure to be an overvaluation, a reduction of \$24,000,000 was made during the year 1916, thus decreasing the assessed valuation of property to \$1,225,199,210.

The constitution of the State of Colorado permits a tax levy of not to exceed 4 mills on each dollar for the maintenance of the entire State government. During the year 1915 the tax levy was only $2\frac{1}{10}$ mills, which is estimated to produce a revenue of \$2,623,318. During the year 1916 the tax levy was reduced to $2\frac{7}{100}$ mills, which will produce a revenue lower than that of 1915.

The amount of the tax levy that may be used for general purposes, i. e., the support of the legislative, executive, and judicial branches of the Government, is 0.659976 mill which is estimated to produce for the year 1915, \$824,441. If to this amount there be added the revenues derived from other sources, as, for instance, the inheritance tax, there will be a total income for general purposes of \$1,427,627.

Tabulation of expenditures of the State board of health for the 12 months' period ended June 30, 1916.

| | Board of health. | Secretary to the board of health. | General administration. | Epidemiological. | Sanitary engineering. | Educational. | Diagnostic laboratory. | Vital statistics. | Foods and drugs. | Licensing of hospitals. | Total. |
|--|------------------|-----------------------------------|-------------------------|------------------|-----------------------|--------------|------------------------|-------------------|------------------|-------------------------|-----------|
| Advertising..... | | | | | | | | | \$1.60 | | \$1.60 |
| Badges..... | | | | | | | | | 2.00 | | 2.00 |
| Binding..... | | | | | | | | \$127.50 | | | 127.50 |
| Cameras and repairs..... | | | | | | | | | 1.25 | | 1.25 |
| Drugs, chemicals, and disinfectants..... | | | | | | | | | 1.85 | | 1.85 |
| Emergency services..... | | | \$22.00 | \$51.70 | | | | 100.00 | 32.50 | | 206.20 |
| Express, freight, and drayage..... | | | | | | | | | 3.37 | | 3.37 |
| Flash light and batteries..... | | | | | | | | | 3.85 | \$1.75 | 5.60 |
| Laboratory supplies..... | | | | | | | \$86.51 | | | | 86.51 |
| Miscellaneous..... | | | | | | | | | 3.75 | | 3.75 |
| Office supplies..... | | | 17.10 | | | | | | 1.65 | | 18.75 |
| Postage..... | | | 76.00 | | | | 24.00 | 15.00 | 4.60 | | 119.60 |
| Printing..... | | | | 29.00 | | 1 \$786.01 | 3.50 | 408.70 | 138.26 | | 1,355.47 |
| Purchase of samples..... | | | | | | | | | 88.31 | | 88.31 |
| Salaries..... | | \$1,000.00 | | 2,100.00 | | | 1,500.00 | 2,400.00 | 8,300.00 | | 15,300.00 |
| Specimen outfits..... | | | | | 30 | | 69.00 | | | | 69.30 |
| Stationery..... | | | 70.00 | 4.10 | | | | | 18.65 | | 92.75 |
| Telegraph and telephone..... | | | 89.79 | 1.50 | | | 1.93 | | 24.59 | | 117.81 |
| Traveling expenses..... | \$33.05 | | | 143.99 | 161.01 | | | 22.30 | 1,290.93 | 70.95 | 1,722.23 |
| Typewriter and repairs..... | | | 10.10 | | | | | | | | 10.10 |
| | 33.05 | 1,000.00 | 284.99 | 2,330.29 | 163.81 | 786.01 | 1,684.94 | 3,073.50 | 9,917.16 | 72.70 | 19,346.45 |

¹ Annual report or bulletin.

Calculating the amount which should go to the State board of health on the 2 per cent basis, there would be \$28,552, an amount inadequate to meet the requirements of a modern health department if the work of the food and drug division is to be included.

The amount required to effect an organization in Colorado capable of carrying on all of the activities required of a modern State board of health is \$35,500, or approximately $2\frac{1}{2}$ per cent of the revenue that may be used for general purposes. This represents a tax levy of but three-one hundredths of 1 mill. It should be expended about as follows:

| | |
|--|----------|
| One State health officer, at not less than..... | \$3, 500 |
| One medical inspector, at not less than..... | 2, 500 |
| One sanitary engineer, at not less than..... | 2, 000 |
| One chief of the division of vital statistics, at not less than..... | 1, 500 |
| One bacteriologist, at not less than..... | 1, 800 |
| One chief of the food and drug division, at not less than..... | 2, 000 |
| One chemist, at not less than..... | 2, 000 |
| Three food inspectors, at \$1,200..... | 3, 600 |
| One drug inspector..... | 1, 500 |
| Three clerks and stenographers, at \$1,200..... | 3, 600 |
| One stenographer..... | 900 |
| One laboratory attendant..... | 720 |
| Traveling expenses..... | 4, 500 |
| Maintenance of laboratory..... | 900 |
| Printing, publications, exhibits, etc..... | 2, 500 |
| Office expenses, incidental expenses, etc..... | 1, 980 |
| | <hr/> |
| | 35, 500 |

The above-described scheme contemplates placing the executive officer of the State board of health, the medical inspector, and the bacteriologist on a full-time basis, and adding four additional employees to the force—namely, a sanitary engineer, a chemist, a clerk and a laboratory attendant.

RECOMMENDATIONS.

After a thorough study of the State board of health and careful consideration of the public health needs of the State, the following recommendations are offered:

That the secretary of the State board of health be placed on a full-time basis; that he receive a salary of not less than \$3,500 per year; and that he hold his office as long as he renders efficient services to the State.

That for administrative purposes the State health organization be divided into the board of health, the executive office, a division of epidemiology, a division of public health engineering, a division of statistics, and a division of foods and drugs.

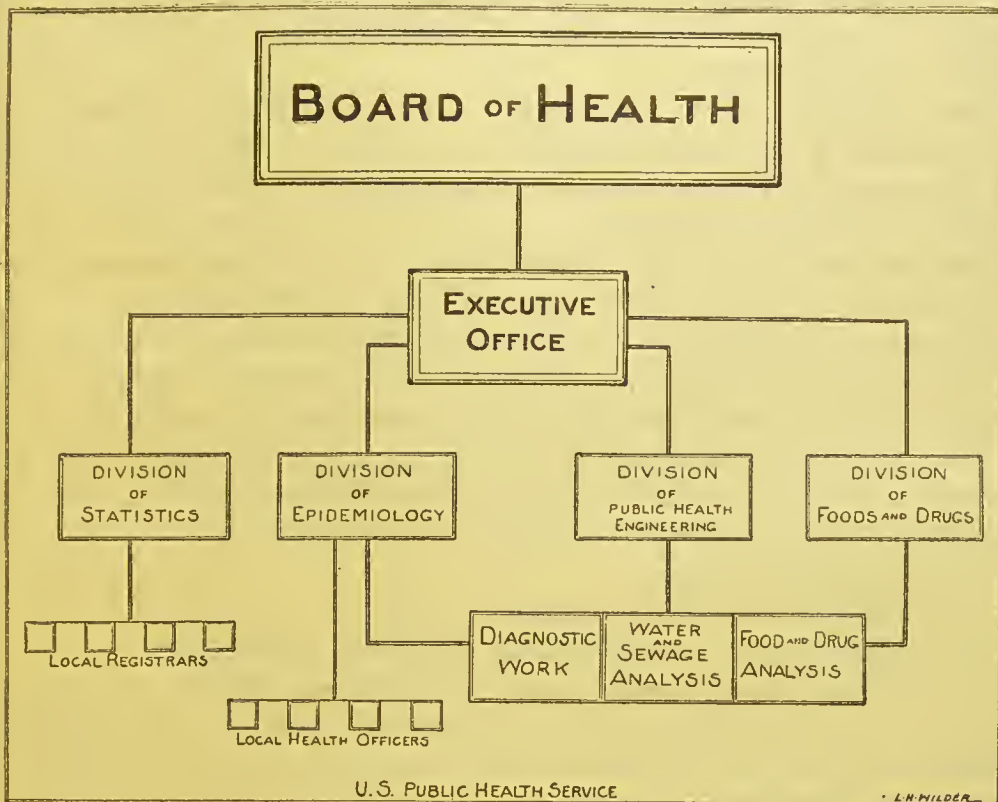
That the medical inspector be employed on a full-time basis and placed in charge of the division of epidemiology; that he receive

a salary of not less than \$2,500 per year; and that he hold his office as long as he renders efficient services to the State.

That a full-time sanitary engineer be placed in charge of the division of public health engineering; that he receive a salary of not less than \$2,000 per year; and that he hold his office as long as he renders efficient services to the State.

That a full-time bacteriologist be employed to perform the technical work of the diagnostic laboratory, to receive a salary of \$1,800, and to hold office as long as efficient services are rendered to the State.

That the clerk of vital statistics be promoted to the position of



Scheme of reorganization suggested for the State Board of Health of Colorado.

chief of the division of statistics; that he receive a salary of not less than \$1,500 per year; and that he hold office as long as he renders efficient services to the State.

That a full-time chemist be employed to perform the chemical work required in the analysis of water, sewage, foods, and drugs, at a salary of \$2,000 per year, and that he hold office as long as he renders efficient services to the State.

That in addition to the above the personnel of the State department of health be increased by the addition of one laboratory attendant and one clerk.

That all of the employees of the health department be full time and hold their office during efficiency.

That the bureau of epidemiology be made responsible for the collection of information regarding the prevalence of disease and for the enforcement of the State laws and regulations relating to morbidity reports, the control of preventable diseases, the work of the diagnostic laboratory, and the supervision of the activities of local health authorities.

That the bureau of public health engineering be made responsible for the activities concerned in the maintenance of the purity of water supplies, the disposal of sewage, garbage, and trades wastes, and the laboratory work entailed in the analysis of water and sewage.

That the bureau of statistics be made responsible for the registration of births and deaths, and the compilation and tabulation of data relating thereto.

That a laboratory be equipped by the State board of health to perform all of the bacteriological or chemical work necessary in the diagnosis of disease and the examination of milk, water, and sewage and foods and drugs.

That the work of the laboratory be divided into three classes—the diagnostic work, water and sewage analyses, and the analyses of foods and drugs—and that for administrative purposes these various classes of work be placed under the supervision of the medical inspector, the sanitary engineer, and the pure food commissioner, respectively.

That the diagnostic work of the laboratory be extended both in amount and scope, so that the physicians and the health officers in the State may have greater facilities to assist them in the diagnosis of communicable diseases.

That energetic efforts be made to secure the notification of reportable diseases and complete birth and death registration.

That educational literature on the different subjects of public health be published by the State board of health and distributed among the citizens of the State and to be used especially for instructing pupils of the public schools.

That a public health exhibit be acquired by the State board of health and exhibited in the different localities of the State, accompanied by lectures and moving pictures.

That larger quarters for the State board of health be provided in the statehouse at Denver.

That a record of the expenditures be kept by the State board of health, according to the nature of the expense and the bureau incurring it, so that the cost of maintaining any bureau, or the cost of any activity, may be determined without delay.

That the food and drug division of the State board of health maintain a sanitary supervision over the farms at which milk is produced, and that the State board of health promulgate the necessary regulations to insure the production of clean milk.

That not less than \$35,500 per year be appropriated to the State board of health to be used in the following manner at the discretion of the State board of health:

| | |
|--|----------|
| One secretary, State board of health..... | \$3, 500 |
| One medical inspector..... | 2, 500 |
| One sanitary engineer..... | 2, 000 |
| One chief of the division of vital statistics..... | 1, 500 |
| One bacteriologist..... | 1, 800 |
| One chief of the food and drug division..... | 2, 000 |
| One chemist..... | 2, 000 |
| Three food inspectors, at \$1,200 each..... | 3, 600 |
| One drug inspector..... | 1, 500 |
| Three clerks and stenographers, at \$1,200 each..... | 3, 600 |
| One stenographer..... | 900 |
| One laboratory attendant..... | 720 |
| Travel expenses..... | 4, 500 |
| Maintenance of laboratory..... | 900 |
| Printing, publications, exhibits, etc..... | 2, 500 |
| Office expenses, incidental expense, etc..... | 1, 980 |
| | <hr/> |
| | 35, 500 |

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YEAR 1916.**

318. Standards for Milk—Their Necessity to the Welfare of the Dairy Industry. By John F. Anderson. P. H. R., Jan. 7, 1916.
319. The Practicing Physician—What he Should Know about the Registration of Births and Deaths and the Reporting of Sickness. By John W. Trask. P. H. R., Jan. 14, 1916.
320. Pyorrhea Alveolaris—Preliminary Report on Treatment with Ipecac and Emetin Hydrochloride. By John S. Ruoff. P. H. R., Jan. 21, 1916.
321. Narcotic Drugs—Recent Legislation Designed to Restrict their Use. By M. I. Wilbert. P. H. R., Jan. 21, 1916.
322. Mental Manifestations of Pellagra. By W. F. Lorenz. P. H. R., Feb. 4, 1916.
323. Morbidity Registration in the United States—A Suggestion as to the Formation of a Provisional Registration Area for Morbidity. By John S. Fulton and John S. Fulton, jr. P. H. R., Feb. 11, 1916.
324. Anopheles Punctipennis Say—Its Relation to the Transmission of Malaria—Report of Experimental Data Relative to Subtertian Malarial Fever. By M. Bruin Mitzmain. P. H. R., Feb. 11, 1916.
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340. Public Health Administration in Florida. By Carroll Fox. P. H. R., June 2, 1916.
341. Health of Garment Workers—The Relation of Economic Status to Health. By B. S. Warren and Edgar Sydenstricker, with an introduction by J. W. Schereschewsky. P. H. R., May 26, 1916.
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343. Cyanide Gas for the Destruction of Insects—With Special Reference to Mosquitoes, Fleas, Body Lice, and Bedbugs. By R. H. Creel and F. M. Faget. P. H. R., June 9, 1916.
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345. The Notifiable Diseases—Reported Prevalence during 1915 by States—Dengue, Diphtheria, Malaria, Measles, Epidemic Cerebrospinal Meningitis, Poliomyelitis, Rabies, Rocky Mountain Spotted Fever, Scarlet Fever, Septic Sore Throat, Smallpox, Tuberculosis, Typhoid Fever, and Typhus Fever. Cases Reported, Indicated Case Rates per 1,000 Population, and Indicated Fatality Rates per 100 Cases. P. H. R., June 23, 1916.
346. Directory of City Health Officers—Containing the Names and Official Titles of the Health Officers of Cities Having a Population of Over 10,000 in 1910. P. H. R., June 30, 1916.
347. The Notifiable Diseases—Prevalence During 1915 in Cities of Over 100,000—Diphtheria, Gonorrhea, Malaria, Measles, Epidemic Cerebrospinal Meningitis, Pellagra, Poliomyelitis, Rabies in Man, Rabies in Animals, Scarlet Fever, Smallpox, Syphilis, Tuberculosis, and Typhoid Fever. Cases Reported, Indicated Case Rates per 1,000 Population, and Indicated Fatality Rates per 100 Cases. P. H. R., June 30, 1916.
348. Public Health Administration in Nebraska. By Carroll Fox. P. H. R., July 7, 1916.
349. Hay Fever and its Prevention. By W. Scheppegrell, M. D. P. H. R., July 21, 1916.
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351. Artificial Purification of Oysters—A Report of Experiments Upon the Purification of Polluted Oysters by Placing Them in Water to Which Calcium Hypochlorite has been Added. By William Firth Wells. P. H. R., July 14, 1916.
352. Health Insurance—Report of Standing Committee Adopted by the Conference of State and Territorial Health Authorities with the United States Public Health Service, Washington, D. C., May 13, 1916. Committee: William C. Woodward and B. S. Warren. P. H. R., July 21, 1916.
353. Pellagra—The Value of the Dietary Treatment of the Disease. By J. R. Ridlon. P. H. R., July 28, 1916.
354. Syphilis—Some of its Public Health Aspects. By L. L. Williams. P. H. R., Aug. 4, 1916.

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357. Diagnosis of Plague in Rats—The Advisability of Making Routine Microscopic Examinations of Rats Supplementary to the Microscopic Examination. By C. L. Williams. P. H. R., Aug. 18, 1916.
358. Mental Examinations of School Children—The School as a Factor in the Mental Hygiene of Rural Communities. By Taliaferro Clark. P. H. R., Aug. 25, 1916.
359. Anopheles Infectivity Experiments—An Attempt to Determine the Number of Persons one Mosquito can Infect with Malaria. By M. Bruin Mitzmain. P. H. R., Sept. 1, 1916.
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368. Drinking Water on Interstate Carriers—A Study of Conditions on Steam Vessels Engaged in Interstate Commerce in the Sanitary District of the Great Lakes. By J. O. Cobb, C. L. Williams, and H. P. Letton. P. H. R., Oct. 13, 1916.
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371. Sanitation in the Philippine Islands—Work of the Sanitary Commissions. By J. D. Long. P. H. R., Oct. 27, 1916.
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374. Fly Poisons—Studies on Sodium Salicylate, A New Muscicide, and on the Use of Formaldehyde. By Earle B. Phelps and Albert F. Stevenson. P. H. R., Nov. 3, 1916.
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376. The Transmissibility of Pellagra—Experimental Attempts at Transmission to the Human Subject. By Joseph Goldberger. P. H. R., Nov. 17, 1916.
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383. Public Health Administration in Colorado. By Carroll Fox. P. H. R., Dec. 29, 1916.





PRESENTED BY
PROF. G. H. F. KUTTALL

UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, SURGEON GENERAL

PUBLIC HEALTH ADMINISTRATION IN
SPRINGFIELD, OHIO

BY

CARROLL FOX

Surgeon, United States Public Health Service

REPRINT No. 417

FROM THE

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PUBLIC HEALTH ADMINISTRATION IN SPRINGFIELD, OHIO.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of health organization and administration in the city of Springfield, Ohio. The study was carried on throughout a period of approximately two months, from February 19 to April 14, 1917, and included investigations in both the office and the field.

Springfield is a prosperous city, situated in the southwestern section of the State of Ohio, 80 miles north of Cincinnati, 25 miles northeast of Dayton, and 45 miles west of Columbus. It is the county seat of Clark County. A small stream, known as Buck Creek, passes through the city. This creek empties into the Mad River just without the city limits.

Springfield is a manufacturing community, surrounded by agricultural country. Among the industries of magnitude may be mentioned the manufacture of road rollers, agricultural implements, gas and gasoline engines, steam radiators, windmills and pumps, automobile trucks and pleasure cars, emery wheels, chemicals, flour mills, steel structural work, house furnaces, electric fans and motors, coffins and caskets, productive machinery, piano plates, and motor washers. Springfield is also noted for its horticultural industries.

The city is served by four railroads (the Big Four, the Pennsylvania, the Erie, and the Detroit, Toledo & Ironton), in addition to five traction lines.

The population figures used in this report were obtained from the United States Census Bureau, which estimates the population as of July 1, 1916, at 51,550. The colored population of the city is 5,350.

For assistance and information received during the course of this study acknowledgment is made to the officials of the health and other city departments and to other citizens connected with various charitable organizations or otherwise interested in public health.

ORGANIZATION AND ADMINISTRATION.

The city of Springfield is under the commission-manager form of government. The commission is composed of five members, elected from a nonpartisan ticket. This commission appoints the city manager as the administrative head of the municipal government. He in turn is authorized to appoint certain of the city officials

¹ Reprint from the Public Health Reports, vol. 32, No. 32, Aug. 10, 1917, pp. 1255-1278.

as deputies in departments over which he has immediate control. Among these deputies is the health officer, who is officially known as the director of public health.

The activities engaged in by the health department are the registration of births, deaths, and diseases; the control of diseases, including the operation of an antituberculosis dispensary and field work in connection therewith; the maintenance of a diagnostic laboratory; the inspection of milk and other foods; the abatement of nuisances; plumbing inspection; and the treatment of the indigent sick.

Personnel.—The personnel of the health department, together with their respective salaries, is at present as follows:

| | |
|--|--------------------|
| 1 director of health (full time)----- | \$2,500 |
| 1 assistant director and city physician (full time)----- | 1,500 |
| 1 public-health nurse----- | ¹ 1,080 |
| 1 public-health nurse----- | 960 |
| 1 dairy and food inspector and city veterinarian----- | 1,400 |
| 1 sanitary inspector----- | 900 |
| 1 plumbing inspector----- | 1,400 |
| 1 clerk----- | 840 |
| 1 poundmaster (six months)----- | 480 |
| 1 laboratory attendant, paid at the rate of 15 cents per hour for not more than 100 hours per month. | |

The director of health.—The director of health is a physician, experienced in public-health work. The city manager makes the appointment and it is to him that the director is responsible for the work of the health department.

The powers and duties of the health officer are defined by State laws. In addition he is required to enforce the city ordinances pertaining to health and sanitation and to perform such other duties as the city manager may direct.

The duties of the director may be defined as administrative, epidemiological, bacteriological, and professional, the latter furnished at the dispensary for the treatment of the tuberculous and the indigent sick.

The assistant director of health.—The assistant director is in reality the city physician. His duties are mainly concerned with the treatment of the city's poor, and professional services furnished to the city jail. He is required to respond to night calls. He is employed on full time and, therefore, is in a position to assist the director in work of a strictly public health nature as well as to perform the duties of a city physician.

During the year 1916 the work performed by the health department on account of diseases other than those affecting the public health included 792 visits made to homes of sick persons, 335 treat-

¹ The salary of this nurse is paid by the Federated Clubs.

ments given at the dispensary, and in addition there were 37 physical examinations made for the police and fire departments.

The clerk.—The clerk of the department has numerous duties to perform. He is telephone clerk, vital statistics clerk, complaint clerk, order clerk, license clerk, record clerk, bureau of information, and stenographer and typewriter.

The sanitary inspector.—The sanitary inspector is engaged in the customary duties of that office, including the posting of placards and fumigations.

Office hours.—The office, dispensary, and laboratory are located in the city hall. The official hours are from 8 a. m. to 5 p. m., with one hour for lunch every day except Saturday, Sunday, and holidays. On Saturday the office closes at noon. On Sundays and holidays it is closed, but burial permits may be secured from the residence of the director or the clerk.

The dispensary is open to the tuberculous from 1 to 3 p. m. on Tuesdays and Fridays, and for the treatment of the indigent suffering from other ailments from 8 to 9 a. m. and 1 to 2 p. m., daily.

Each employee may be granted two weeks' vacation a year with full pay.

Transportation.—The director, the assistant director, and the dairy inspector are each furnished with inexpensive automobiles. This form of transportation enables these officials to perform a large amount of work efficiently and expeditiously at a reasonable figure. During the year 1916 the cost of operating the three machines was \$630.90, or \$210.30 for each machine, including gas, oil, tires, and repairs. This amounts to but 67-cents per machine per working day.

The plumbing inspector is furnished with street-car tickets. The sanitary inspector and nurses ride free on the street cars.

Dissemination of information.—Except for the annual report, there is no bulletin published by the health department. On a few occasions public health exhibits, including the State board of health exhibit, have been shown, and talks on public health subjects are occasionally given. Articles of a public health nature are published in the newspapers from time to time.

In order that better cooperation may be obtained between the various local health officers throughout the county and that uniform procedures may be established, the director of health has been instrumental in organizing the Clark County Health Officials' Association, which meets once a month at the health department in Springfield. Here talks are given and there is an interchange of ideas. It is an educational feature that should be productive of great good. Very frequently a representative of the State board of health is in attendance at these meetings.

Discussion.—The system of government in the city of Springfield, when considered with the efficiency of the officials in charge, may be said to be one approaching the ideal. Under this form of government there has been developed the nucleus of a health department which requires only a little financial assistance and the cooperation of the people to expand into a highly efficient organization.

The cooperation of the people can be obtained only after a campaign of education, which has not in the past been carried on to any great extent. It is thought that the scheme of education which will produce the best results is that which will instruct the school children on the subject of disease prevention. To accomplish this it would be advisable for the board of education to place the health officer on its staff, he to give lectures on public health once a week in the high school, and if time will permit, in the grade schools as well. The health department should then publish a small weekly bulletin to be distributed to the children at the close of the lecture and to contain briefly the subjects which have been lectured upon.

This course in public health should be made a part of the regular curriculum and the pupils should be made to pass an examination upon it, as in the case of other subjects taught.

The health department has been making very commendable efforts to keep accurate statistics on births, deaths, diseases, etc. Such statistics, together with the record of expenditures, are the bookkeeping of the public health, and it is only by comparison of these various records that the health department can determine its profits and losses. It is a difficult matter to keep accurate figures with continual interruptions, and it is thought advisable to employ an additional clerk, who could act as telephone clerk and bureau of information and thus permit the clerk already employed to devote his time purely to clerical matters.

As is usual in most health departments, the sanitary inspector is engaged to a large extent in the abatement of nuisances which have little or no bearing upon the public health. He should be in a position to devote his entire time to the elimination of those nuisances which are really important from a public health standpoint, such as surface privies and surface wells, accumulations of manure, and mosquito breeding centers, and to the enforcement of the requirement that householders provide themselves with garbage cans.

The abatement of such nuisances as bad odors, ash heaps, dead dogs, chickens, slop water, etc., should be left to the police. The cleaning of alleys is as much a duty of the street department as is the cleaning of streets and should not be made a duty of the health officer. An ordinance requiring the cutting of weeds is needed, but this matter should be placed in the police department for its enforcement.

It is necessary that the work of the employees of the health department be systematized and it would be wise to formulate a book of instructions, so that each employee of the department would know exactly what were his or her duties, authority, and jurisdiction.

REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths is carried on under the authority of State law. The health officer of Springfield is the local registrar for the city and the adjoining townships. The registrar's fees paid by the county to the registrar are transferred to the city treasury and may be made available for carrying on public-health work.

Registration of deaths.—During the year 1916 there were reported as occurring in the city of Springfield 849 deaths, exclusive of stillbirths, making a crude death rate of 16.4 per thousand.

Of the above deaths, 417, or 49 per cent, were due to diseases or conditions which might be classed as preventable, according to the information contained on the death certificates.

During the same year there were 95 deaths of infants under 1 year of age. The infant mortality rate was 80.3 per 1,000 births.

The number of stillbirths reported during the year was 59.

Among the colored population there were 98 deaths, exclusive of stillbirths, making a death rate of 18.3 per thousand. Of these deaths, 11 occurred in children under 1 year of age. The infant mortality rate for colored was, therefore, 98.2 per 1,000 births.

Registration of births.—During the year 1916 there were reported as occurring in the city of Springfield 1,183 births, exclusive of stillbirths, making a birth rate of 22.9 per thousand.

The number of births among the colored population was 112, making a colored birth rate of 20.9 per thousand.

Recapitulation.

| | White. | Colored. | Total. |
|---|--------|----------|--------|
| Population..... | 46,200 | 5,350 | 51,550 |
| Number of deaths..... | 751 | 98 | 849 |
| Death rate per 1,000..... | 16.2 | 18.3 | 16.4 |
| Deaths due to preventable causes..... | | | 417 |
| Deaths in infants under 1 year..... | 84 | 11 | 95 |
| Infant mortality rate per 1,000 births..... | 78.4 | 98.2 | 80.3 |
| Number of births..... | 1,071 | 112 | 1,183 |
| Birth rate per 1,000..... | 23.1 | 20.9 | 22.9 |
| Stillbirths..... | 48 | 11 | 59 |

The following table gives certain statistics relative to morbidity and mortality compiled from death certificates filed in the health department during the year 1916.

| Diseases. | Total deaths, all ages. | Death rate per 100,000. | Number of cases reported. | Case fatality per 100. | Deaths under 1 year of age. |
|---|-------------------------|-------------------------|---------------------------|------------------------|-----------------------------|
| Tuberculosis, pulmonary..... | 61 | 118.3 | 105 | ..... | ..... |
| Tuberculosis, other forms..... | 11 | 21.3 | ..... | ..... | 1 |
| Pneumonia..... | 74 | 143.5 | 12 | ..... | 14 |
| Typhoid fever..... | 17 | 32.9 | 80 | 21.2 | ..... |
| Influenza..... | 25 | 48.4 | ..... | ..... | ..... |
| Measles..... | 7 | 13.5 | 919 | .76 | 2 |
| Diphtheria..... | 4 | 7.7 | 51 | 7.8 | ..... |
| Scarlet fever..... | 3 | 5.8 | 105 | 2.8 | ..... |
| Whooping cough..... | 10 | 19.3 | 246 | 4.0 | 3 |
| Meningitis..... | 7 | ..... | ..... | ..... | 2 |
| Septicemia..... | 11 | ..... | ..... | ..... | ..... |
| Erysipelas..... | 1 | ..... | ..... | ..... | ..... |
| Syphilis..... | 4 | ..... | 8 | ..... | 2 |
| Tetanus..... | 1 | ..... | 1 | ..... | ..... |
| Chicken pox..... | ..... | ..... | 302 | ..... | ..... |
| Gonorrhea..... | ..... | ..... | 9 | ..... | ..... |
| Mumps..... | ..... | ..... | 5 | ..... | ..... |
| Ophthalmia neonatorum..... | ..... | ..... | 7 | ..... | ..... |
| Smallpox..... | ..... | ..... | 4 | ..... | ..... |
| Trachoma..... | ..... | ..... | 4 | ..... | ..... |
| Diarrhea and enteritis..... | 29 | ..... | ..... | ..... | 17 |
| Other infections..... | 7 | ..... | ..... | ..... | ..... |
| Malignant growths..... | 38 | 73.7 | 1 | ..... | ..... |
| Occupation accidents..... | 6 | ..... | ..... | ..... | ..... |
| Other accidents..... | 47 | ..... | ..... | ..... | ..... |
| Premature..... | 18 | ..... | ..... | ..... | 18 |
| Convulsions, malnutrition, etc..... | 13 | ..... | ..... | ..... | 13 |
| Other causes peculiar to early infancy..... | 23 | ..... | ..... | ..... | 23 |
| Total..... | 417 | ..... | ..... | ..... | 95 |

EPIDEMIOLOGICAL ACTIVITIES.

Report of Diseases.

The notification of diseases is required by law and by the regulations of the State board of health. These regulations are based on the model law for morbidity reports.

Methods of procedure.—In reporting diseases physicians usually make use of the telephone. The information reported is noted temporarily on a blank form, which is referred for necessary action to the official responsible for the enforcement of the regulations to prevent the spread of the disease. It is likewise entered on a card for the permanent records of the department, as well as on a morbidity report card, which is forwarded weekly to the State board of health.

Control of Diseases.

Requirements of laws and ordinances.—The requirements of State laws have been summarized in a previous report. It is not thought necessary to summarize the local ordinances.

Methods of procedure.—The State laws form the basis on which are applied the preventive measures for the control of the communicable diseases.

A record of certain data, as for instance the date of release of quarantine, date of fumigation, number of children in household, etc., is made on the morbidity report card filed as a permanent record of the department.

An epidemiological history is obtained of each case of smallpox and typhoid fever, the former by the health officer or his assistant, the latter by these officials or by one of the nurses.

At least one follow-up visit is made by a nurse to each case of typhoid fever and diphtheria, and some supervision is maintained over tuberculosis.

In the case of scarlet fever and diphtheria houses are placarded by the health officer or his assistant, who at the same time gives the necessary instructions relative to isolation of the patient, quarantine of contacts, etc. In the case of other disease, placards are posted by the sanitary inspector, who also performs the fumigations required by law.

After recovery from a communicable disease a certificate is furnished to the patient, stating that he has had such a disease. This is not only of value for future use in determining immunes but also serves as authority to return to school.

A monthly record sheet, to serve as a "daily reminder," is kept, showing the name and address of patient and the diagnosis for each disease requiring quarantine, together with the date on which quarantine is due to be raised.

The school is notified whenever a pupil has, or is exposed to, a quarantinable disease.

The following table shows the amount of work engaged in by the health department during 1916 in matters relating to quarantine and kindred subjects:

| | |
|---|--------|
| Total number of houses quarantined..... | 1, 150 |
| Total number of throat cultures taken..... | 400 |
| Total number of persons given antitoxin..... | 22 |
| Total number of vaccinations made..... | 108 |
| Total number of certificates of immunity issued..... | 930 |
| Total number of medical examinations made for differential diagnosis... | 306 |
| Total number of houses fumigated..... | 196 |
| Total number of rooms fumigated..... | 563 |

Typhoid fever.—Typhoid fever is endemic in the city of Springfield. During the year 1916 there were 80 cases notified, with 17 deaths, making an indicated death rate of 32.9 per 100,000, and a case fatality rate of 21.2 per cent. The number of cases of typhoid fever reported during the years 1914, 1915, and 1916, as well as for the combined periods, is shown in charts 1 and 2. The records for the years previous to 1914 are not complete and have, therefore, not been used.

The health department is now making a careful epidemiological study of each case of typhoid fever as it is reported, but as yet there is not sufficient data on which to base conclusions. Previously the

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investigations as to the source of the infection were confined almost entirely to the milk and water supply of the household.

Houses are not placarded for typhoid fever.

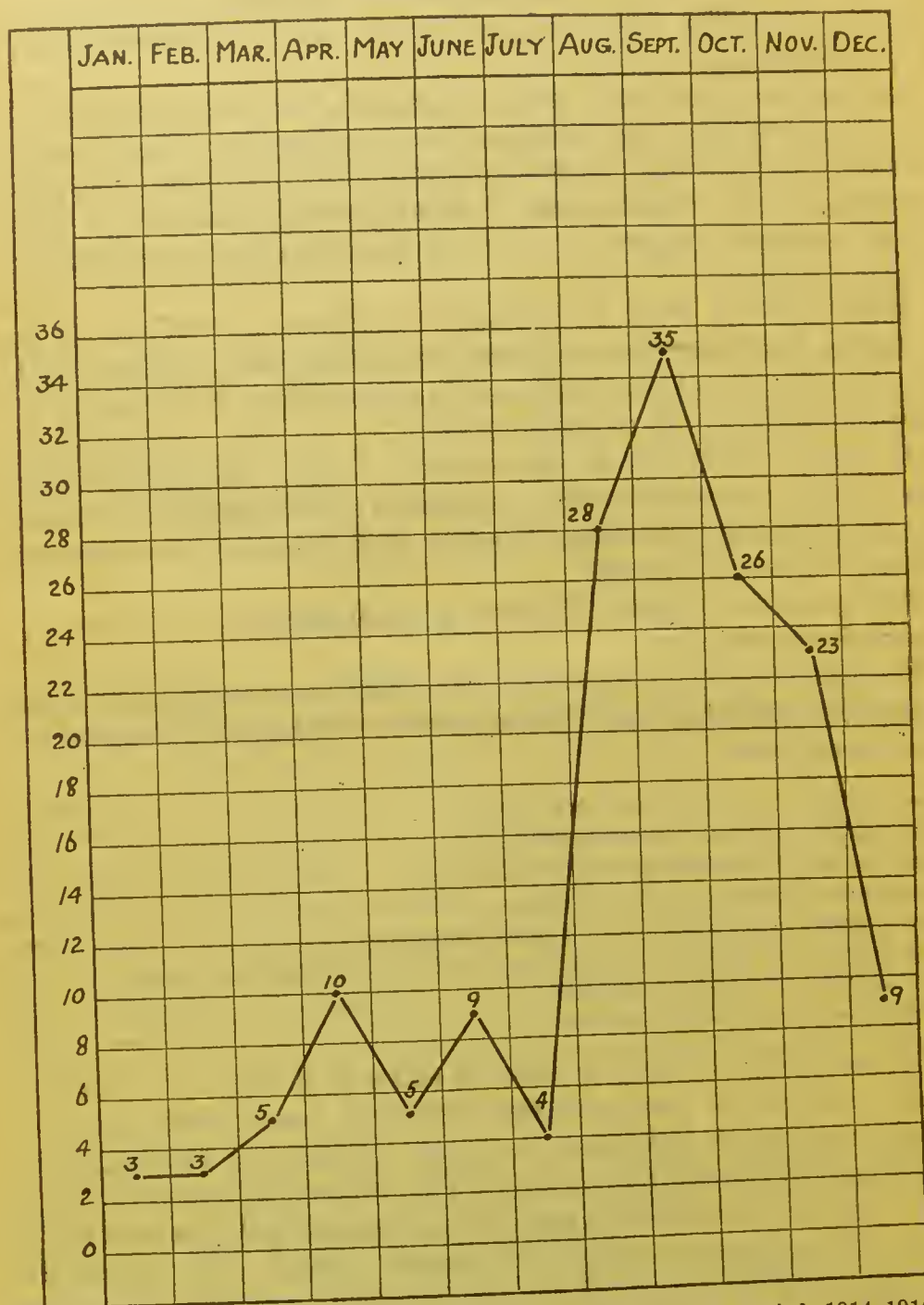


CHART 1.—Cases of typhoid fever reported by months, three-year period, 1914–1916.

Diphtheria.—During the year 1916 there were 51 cases of diphtheria notified to the health department, with four deaths. This is an excellent record, meaning an indicated death rate of but 7.7 per 100,000 and case fatality rate of but 7.8 per cent.

When a case of diphtheria is reported the house is placarded and quarantined, a culture from the wage earner is taken, and an immunizing dose of antitoxin given to contacts, either by the attending physician or a physician of the health department. Antitoxin

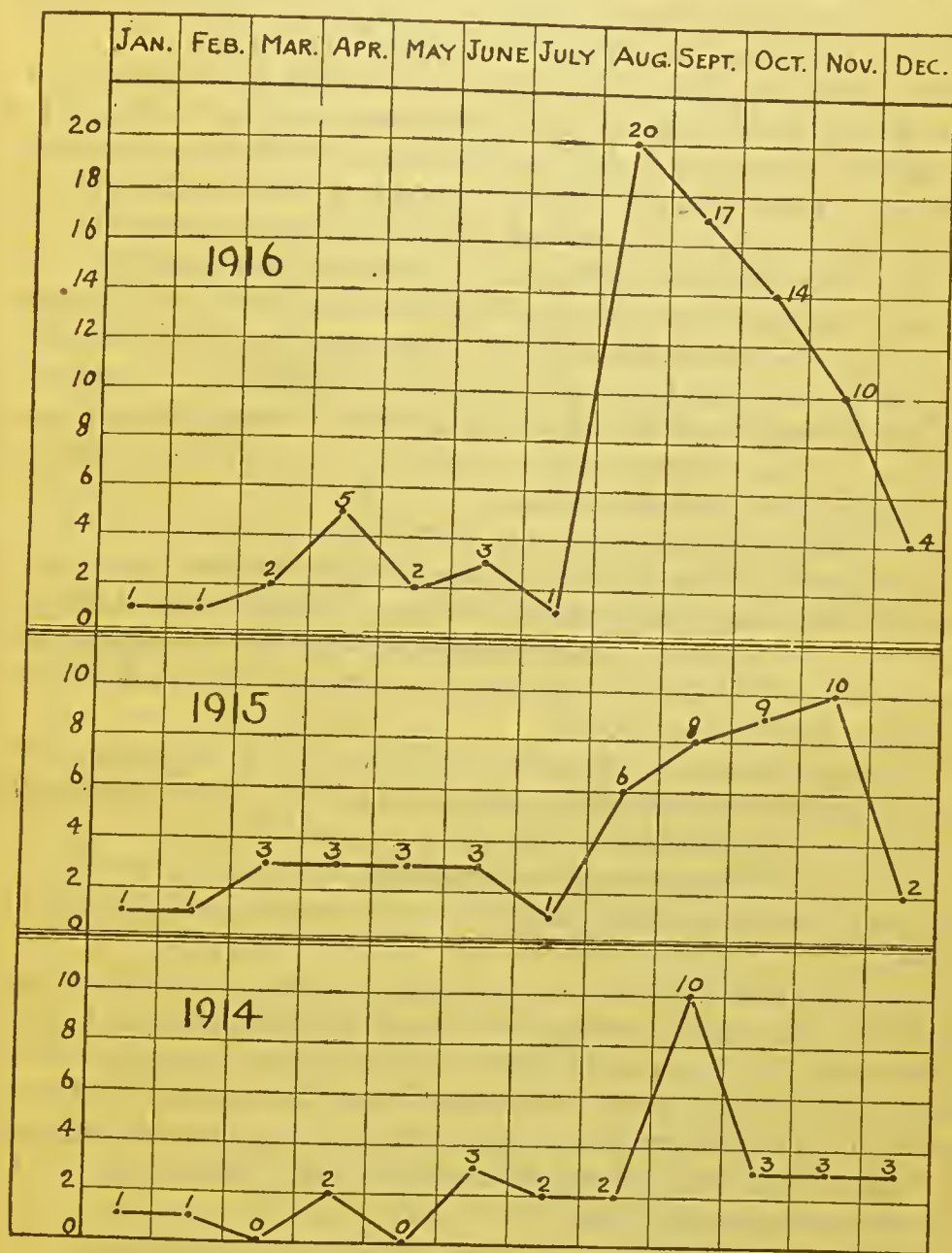


CHART 2.—Cases of typhoid fever reported by months, 1914, 1915, 1916.

is issued free of charge, both for treatment and prophylaxis. At the same time cultures are also taken of contacts outside of the household, including pupils of public and parochial schools. The patient is released from quarantine after two successive negative cultures are obtained, taken not less than 48 hours apart. At the time of taking the second culture, swabbings are also made of contacts

in the household. Routine cultures are taken either by one of the physicians of the health department or one of the nurses.

If practicable, cases of diphtheria are isolated in the hospital, when adequate isolation can not be obtained at the home. In this case, all contacts are released without quarantine immediately after finding the nose and throat free from diphtheria bacilli.

The isolation hospital.—The isolation hospital is conveniently located on the grounds of the general hospital, operated by the city of Springfield. It is a brick and wooden structure, formerly a residence, and is now out of repair. It contains two bath rooms and eight other rooms, one of which must be used by the nurses in attendance and one for a diet kitchen, which leaves six rooms for ward purposes. Fourteen patients may be isolated without overcrowding. The present condition of the building makes its use as a hospital undesirable, and taking into consideration its age and construction, as to material and design, to remodel would be impracticable. The building at present is not in use. Plans are completed for a new building which will be constructed in the near future.

Tuberculosis.—During the year 1916 there were reported to the local registrar 61 deaths from pulmonary tuberculosis. During the same period there were notified 105 cases. The indicated death rate was 118.3 per 100,000. There were also reported 11 deaths from other forms of tuberculosis, making a death rate from tuberculosis, all forms, of 139.6 per 100,000.

The antituberculosis dispensary.—The city health department operates an antituberculosis dispensary, which is open twice a week with a doctor and a nurse in attendance.

Patients are referred to the dispensary from various sources, including physicians of the city, the city hospital, and the visiting nurses.

Such information as may be necessary subsequently to identify an applicant for relief is entered in a ledger. The personal and family history and the results of physical and laboratory examination, together with the advice and treatment given are entered on a filing card devised for the purpose. On another card is noted the information relative to temperature, pulse, weight, etc., obtained from time to time at subsequent visits.

Patients are provided with paper napkins and medicines free of charge.

Each case is followed up by a visiting nurse, who gives the necessary advice as to the right way of living to effect a cure and to prevent the spread of the disease to others.

A record of her visits, together with the social history of the patient, is kept by the nurse in a separate file.

During the year 1916 the following work was done in the anti-tuberculosis dispensary:

| | |
|---|-----|
| Number of new cases treated..... | 103 |
| Number of old cases treated..... | 79 |
| Total visits to dispensary..... | 239 |
| Number of patients referred to tuberculosis hospital..... | 41 |

The tuberculosis sanatorium.—The tuberculosis sanatorium is a four-county institution, pleasantly located just without the limits of the city of Springfield. It is composed of a community cottage for both male and female patients, 14 small cottages, a nurses' quarters, and an administrative building, originally a private residence, in which are located a dispensary, office, the main kitchen and dining room, quarters for the help, and rooms for the care of advanced cases.

The physician in charge does not reside on the premises.

The normal capacity of the institution is 40 patients. There are at present 41 undergoing treatment, most of them citizens of Springfield.

The water supply is derived from a drilled well and is furnished to the buildings and grounds under pressure from a pressure tank.

Sewage is disposed of by means of a septic tank and filter beds.

The community cottage, administration building, nurses' quarters, and laundry are connected to the sewer.

The sanatorium operates its own dairy and chicken farm, and products are raised from the soil.

The antituberculosis league.—This league is a charitable organization which employs one field agent or investigator whose duty it is to investigate the social status of families in which there is a case of tuberculosis and who have applied for material assistance. Supplies, including milk, eggs, coal, etc., are issued free of charge to worthy applicants. The paper napkins used in the dispensary of the health department are furnished by the league. The league will also support patients in sanatoria. While most of the public-health activities concerned with tuberculosis are now carried on by the health department, a certain amount is still performed by the investigator of the league who has not the qualifications of a public-health nurse.

A portion of the income of the antituberculosis league is derived from a percentage of the profits accruing to moving picture houses at Sunday shows.

The infant welfare society.—During the period from April to September, inclusive, the infant welfare society, a charitable organization, employs a nurse to do infant welfare work in the field and operates a dispensary located in the courthouse, where children may be taken for advice and treatment. Physicians give their services free of charge. The society also maintains during the hot months of

the year, July and August, an infant welfare camp, at which are employed the necessary attendants and nurses.

Milk is issued free only where the parents can not afford to buy it. Otherwise they are expected to pay if only a small part of the actual price.

The public-health nurses.—There are two public-health nurses working under the supervision of the health officer, one of whom is paid from health department funds and one by the federated clubs.

In addition there is one nurse employed by the board of education, one by the Metropolitan Life Insurance Co., and the antituberculosis league employs one investigator, who is not a nurse. These employees are not under the control of the health department.

The health department nurses are engaged in practically all of the activities required of a public-health nurse, including prenatal and infant welfare work, communicable disease nursing, some school nursing in the field and dispensary work in the health department.

At least one visit is made to each case of typhoid fever and diphtheria, and a supervision is maintained over cases of tuberculosis. Infant welfare work is carried on during the winter. During the summer the bulk of this class of work is performed by the infant welfare society.

The city has been divided into two districts, one for each nurse. The nurses are required to keep daily records of visits made, with special record of visits paid to cases of tuberculosis, together with a card giving the social status of the family.

When practicable, pupil nurses are detailed from the city hospital to the health department to receive instruction and practical experience in public-health nursing. This is an excellent idea.

The following table indicates the field work performed by the nursing staff of the health department during the year 1916. One nurse was on duty during the entire year. The second nurse did not enter upon her duties until October, so worked only during the last three months of the year.

Visits made on account of—

| | |
|---------------------------------|-----|
| Tuberculosis..... | 879 |
| Typhoid fever..... | 90 |
| Diphtheria..... | 183 |
| Exposures to diphtheria..... | 97 |
| Scarlet fever..... | 159 |
| Exposures to scarlet fever..... | 18 |
| Whooping cough..... | 69 |
| Measles..... | 78 |
| Chicken pox..... | 162 |
| Mumps..... | 7 |
| Sore throats..... | 60 |
| Trachoma..... | 25 |

Visits made on account of—Continued.

| | |
|---------------------------------|-------|
| Ophthalmia neonatorum | 22 |
| Various diseases of the eyes | 119 |
| Prenatal | 170 |
| The puerperal state | 91 |
| Infant welfare | 186 |
| Medical and surgical | 210 |
| Miscellaneous | 446 |
| Total | 3,071 |
| Number of throat cultures taken | 307 |

The Diagnostic Laboratory.

The city health department maintains a bacteriological laboratory, equipped to perform all necessary examinations of a routine nature. A part-time laboratory assistant is employed, but most of the technical work is done by the health officer, the assistant health officer, and the milk inspector.

In the laboratory are performed examinations for the diagnosis of diphtheria, the release from quarantine, and the detection of carriers; examinations to determine the Widal reaction and the presence of tuberculosis, gonorrhea, and ophthalmia neonatorum. Analyses of urine are rarely made. The milk inspector examines, bacteriologically and chemically, all milk samples collected. Well and city waters are also analyzed bacteriologically, the former when it may bear some relation to a case of typhoid fever, the latter only occasionally.

Three specimen outfits are furnished to the physicians of the city. These may be obtained free of charge from various drug stores designated as distributing stations.

The outfit to be used in suspected typhoid fever contains an aluminum foil and a small wire loop. In the case of suspected tuberculosis a wide-mouth bottle is furnished, while for diphtheria the outfit contains two sterile swabs in a sterile tube.

Each outfit is accompanied by a card on which to note the necessary data, and which contains directions for the collection of the specimen.

A record is kept by the filing-card system of all examinations made.

During the year 1916 there were made in the laboratory 3,791 examinations, as follows:

| | Positive. | Negative. | Total. |
|--------------------------------|-----------|-----------|--------|
| For tuberculosis..... | | | |
| For diphtheria: | 75 | 164 | 239 |
| Diagnosis..... | | | |
| Release of quarantine..... | 29 | 214 | 243 |
| Contacts..... | 26 | 119 | 145 |
| For typhoid fever (Widal)..... | 16 | 295 | 311 |
| For gonorrhea..... | 4 | 19 | 23 |
| For ophthalmia neonatorum..... | | 2 | 2 |
| Urine analysis..... | | 2 | 2 |
| Water analysis: | | | 8 |
| Well or spring..... | | | |
| City..... | | | 55 |
| River..... | | | 24 |
| Milk analysis: | | | 1 |
| Bacteriological..... | | | |
| Chemical..... | | | 872 |
| Visible dirt..... | | | 928 |
| Grand total..... | 150 | 815 | 3,791 |

Discussion.

According to the modern view, a proper supervision over the individual who is sick or who has been in contact with one who is sick is of more importance than a supervision over the environment, for it is the animate and not the inanimate things which are most concerned in the spread of the communicable diseases.

A very important factor in the control of disease is, therefore, the public-health nurse. It is the nurse who reaches the homes of those persons who are most in need of instruction and nursing care and who can ill afford to pay for it. The work of two nurses in a city the size of Springfield must necessarily be superficial, and it is therefore believed advisable for the city to employ two additional nurses, who, with the one already employed and nurse paid for by the federated clubs, would make a staff of four nurses. The city should then be divided into four districts and a nurse placed in each district to carry on within her district all of the duties required of a public-health nurse.

It would be still better if the school board could be induced to employ an additional nurse and then to combine its nursing staff with that of the health department. The antituberculosis league should employ a nurse instead of an investigator and attach her to the health department. This would give the health department seven nurses, and the city could be divided into seven districts, making the work still more effective.

The work performed by the child welfare society is of great importance. It pertains strictly to public health and is therefore a governmental function and should be taken over by the city and made a duty of the health department, which could carry on the work during the entire year. Steps in this direction have already been taken, since for the year 1917 the city has appropriated to the society the sum of \$2,000, which will be spent under the direction of the city manager.

It is planned to add a wing to the present city hospital, and ample provision should be made for an airy ward for the care of children.

To carry on the child-welfare work extensively every birth reported should be followed up by a visit to the home. Upon the first visit the nurse should be provided with a "certificate of registration" to be presented to the parents. Such certificates would have to be provided by the health department.

The typhoid-fever death rate in the city is very high. All of the factors concerned in its spread are present in the city, including the surface privy, the surface well, flies, contacts, a water supply which at times shows evidence of contamination, and a milk supply which, though 95 per cent is pasteurized, is not always of certain purity because the "flash" method is used in some cases, and this method is unreliable. All of these things should be corrected without delay.

Typhoid fever should be made a placardable disease, and disinfectants should be issued free of charge.

All children should be required to be vaccinated against smallpox before they are permitted to attend public or parochial schools.

A bacteriologist should be provided for the laboratory of the health department, and it is suggested that the laboratory might be made available to all of the physicians and health officers of the county, and that financial aid might be received toward its maintenance from the various townships, or the county commissioners.

It is highly satisfactory to know that the city of Springfield has plans completed for the construction of a modern isolation hospital for the isolation of the communicable diseases, including smallpox, to occupy the site of the present hospital. It should contain not less than 30 beds. It should be operated by the city general hospital, but the admission and discharge of patients should be left to the health officer.

- MUNICIPAL ENGINEERING ACTIVITIES.

The water supply.—The municipal water supply is a ground water, obtained from a large dug well located in a valley about 3 miles from Springfield. Through this valley runs a stream, known as Buck Creek. The actual water-bearing stratum consists of a natural gravel bed on each side of the valley from 15 to 20 or more feet in thickness and extending down to clay. That part of the gravel basin from which the water supply of Springfield is obtained has an area of about 35 acres and is limited above by an outcropping of the hardpan, while below a curtain wall of concrete has been constructed extending from the creek to high ground to conserve the ground water, causing it to back up into the well instead of flowing on down the valley.

During warm weather, when the ground water is low and the amount of water pumped is excessive, not enough water filters into

the well to supply the demand, so that it has been necessary to resort to an underdraining system extending up the valley as far as the outcropping of the hardpan and having its outlet into the well. In addition to this it is necessary at times artificially to augment the natural ground-water supply by flooding the surface of the ground with water from the creek by means of a sluice way. The underdrain has the effect of diminishing the amount of filtration and percolation that naturally takes place and forms a more or less direct means of communication between surface water and the well. Flooding the land with a polluted water places an added burden on the natural filter bed between the surface of the ground and the underdrain and is a dangerous procedure.

In order permanently to increase the supply of water for present and future needs, it has been suggested that the system of underdrains be extended above the outcropping of the hardpan, and then on up the valley where water may be obtained in abundance. This extension would include the utilization of water from a number of springs, one of which is said to flow about 7,000,000 gallons per day. The advisability of such a procedure must be left to the sanitary engineers, and it is therefore suggested that before taking any action a comprehensive study be made of the situation with a view to securing a permanent supply that will be satisfactory both as to quantity and quality. Certain it is that the quality of water from surface wells and springs in a limestone country is uncertain.

The Springfield water is always clear, but bacteriological examinations made at infrequent intervals show at times evidence of the presence of colon bacilli. Daily examinations should be made covering a long period through varying conditions. It is also thought that it would be good practice to install a chlorine plant and treat all water before furnishing to the consumers. Such a plant could be installed at little expense and would serve until such time as a more permanent source of supply can be developed, to counteract the ill effects that may occur through occasional pollution.

In addition to the public water supply there are in the city a number of privately owned surface wells of varying depths, many extending down to bedrock (limestone).

During the year 1916, 55 samples of water from as many different wells and a few springs were examined, and 28 showed positive evidence of pollution. There were also made 24 examinations of the city water, with the result that 10, or 41 per cent, of the samples examined showed evidence of the presence of colon bacilli in 10 cubic centimeter amounts. Similar results have been obtained at the laboratory of the State board of health, and in addition the colon bacillus has occasionally been detected in 1 cubic centimeter.

Disposal of sewage.—The city is fairly well provided with sewers, both storm water and sanitary, and the system is being extended rapidly. Storm-water sewers empty into Buck Creek and the contents of sanitary sewers pass into the Mad River and into Buck Creek untreated. Plans are already laid for the installation of a modern disposal plant.

There are still a number of insanitary privies in the city but these are being abolished as rapidly as possible. During the year 1916 there were 954 premises connected with the sewer, 254 in new and 700 in old buildings.

The disposal of garbage and refuse.—Garbage is collected by contract from residences only, and is fed to hogs. Hotels, restaurants, and commission houses must have their garbage removed by private contract.

The supervision over the system of collection is under the jurisdiction of the city manager's office. The rules adopted to expedite the collection require that all garbage be kept in a metal can with fly-proof cover and that the cover be kept on, that the can be put in a place where it may be easily found by the collector, and that no water, glass, tin cans, grass, etc., be put into the garbage can.

The system of garbage collection used in the city of Springfield is not to be recommended. The city realizes its deficiencies and has plans under way eventually to take over the collection and to erect an incinerator. At the same time a collection of rubbish will be instituted. At present rubbish is collected annually instead of weekly.

FOOD INSPECTION.

The inspection of foods, including milk, and the inspection of places handling foods are carried on by the dairy and food inspector, who is a doctor of veterinary medicine. He also performs the laboratory examinations of samples collected. Samples of milk are collected and examined once a week. With but one inspector for food inspection it is not practicable to exercise a thorough supervision over the sale of foods from all of its various angles. The ante and post mortem inspection of animals killed in the local slaughterhouses is not attempted. Of all foods, milk is by far the most important from the standpoint of the public health, and the inspector has therefore very properly devoted much of his time to the control of the milk supply.

The farms supplying milk to Springfield vary from those with no equipment, primitive methods, and poor stock, farms that score 0 to those modern in equipment and methods with tuberculin-tested, registered stock, and which would score 90 or above. There are, in all, about 350 farms producing milk for sale in Springfield, most

of them operated by farmers who carry on the dairy business merely as a side issue.

Milk is brought to the city in unsealed cans, much of it by wagons or autotrucks. Some is shipped by interurban electric and a small part by railroad. The longest haul is about 12 miles.

It is estimated that about 95 per cent of the raw milk is pasteurized before reaching the consumer. There are four pasteurizing plants, two using the holding and two the flash method. The latter is unreliable and should be supplanted by the holding method, meaning briefly that the milk should be heated rapidly to a temperature of 145° F. and held at that temperature for 30 minutes. To secure accuracy each plant should be equipped with a temperature recorder and a thermoregulator and the technique should be checked frequently by the milk inspector by bacterial counts made during the different stages of pasteurization. After pasteurization the milk should be immediately cooled and bottled. All milk should be delivered to the consumer in machine-capped bottles. At present there is no law prohibiting the sale of dipped milk.

All milk sold in the city should be pasteurized as above and a bacterial standard should be set for pasteurized milk, which should contain not more than 50,000 bacteria per cubic centimeter when delivered to the consumer.

There are 7 slaughterhouses located in and around the city of Springfield. In none is there any inspection of animals slaughtered. One has permission from the Federal authorities to carry on an interstate business. An additional inspector in the city health department could devote some time to meat inspection under the veterinarian of the department, and it would be wise for the city to establish a municipal slaughterhouse, so that slaughtering could be carried on in one place and a better supervision maintained.

The following is a summary of the inspection work carried on by the dairy and food inspector during the year 1916, together with the results of the examinations of milk samples.

| | |
|--|-------|
| Number of samples of milk having 100,000 bacteria or less: | |
| Raw | 421 |
| Pasteurized | 34 |
| Number of samples of milk having over 100,000 bacteria: | |
| Raw | 397 |
| Pasteurized | 20 |
| Number of inspections made: | |
| Dairies | 437 |
| Cows | 4,480 |
| Milk plants | 53 |
| Groceries, meat stores, restaurants, abattoirs, etc. | 1,693 |

THE HEALTH SUPERVISION OF SCHOOLS.

The health supervision of schools is paid for and is under the jurisdiction of the board of education, which employs one nurse for field and dispensary work. There are no medical inspectors employed. A dispensary is maintained in one of the schools, well equipped for medical and dental work. The medical work consists chiefly of the diagnosis and treatment of diseases of the eye, ear, nose, and throat. A specialist gives his services free of charge. The dental work is performed alternately by different members of the dental society, whose services are furnished without cost.

It has already been suggested that the board of education add to its nursing staff and then attach its nurses to the health department. This would be in line with modern views and should result in great benefit to all concerned.

EXPENDITURES AND APPROPRIATIONS.

There was allotted to the health department for use during the year 1916 the sum of \$12,450. This allowance is elastic and may be increased or decreased from time to time by the city commission. During the same period there was expended for operation and maintenance the sum of \$10,785.95, as determined from the records on file in the health department. The cost of operation is shown in more or less detail in the accompanying table.

In addition to the above, the auditor's statement shows that there were certain sums paid out during the year as reimbursements for the payment of bills contracted during the previous year. These expenses have not been included in the itemized statement as not being connected with the actual cost of the department during the year 1916.

During the year there were collected in fees \$2,552.35.

That part of the income of the city for the year 1916 which could be used for expenses incurred in ordinary operation and maintenance of city government was \$409,045. From this amount there was expended for the protection of the public health but 2.6 per cent as against 12.9 per cent for fire, and 10.2 per cent for police protection.

The amount allowed for the protection of the public health during 1917 is even less than that allowed for 1916, although the presence of smallpox has made it necessary to appropriate an additional sum for emergency purposes.

The city of Springfield may take just pride in the fact that it has the foundation of an excellent health department which, by a little rearrangement and some additions, could be made a highly efficient organization. As it is, it is only possible to take up the various problems in a more or less superficial manner.

To carry on the work, as outlined in the foregoing report, would require a minimum expenditure of \$17,000 a year, which figure represents about 4.1 per cent of the available revenues of the city, and which is little enough to spend in the prevention of disease.

The sum might be expended as follows:

| | |
|---|---------|
| 1 health officer..... | \$2,500 |
| 1 assistant health officer and city physician..... | 1,500 |
| 1 bacteriologist..... | 1,000 |
| 1 dairy and milk inspector..... | 1,400 |
| 1 food inspector..... | 900 |
| 1 public-health nurse..... | 960 |
| 2 public-health nurses, at \$900..... | 1,800 |
| 1 sanitary inspector..... | 900 |
| 1 vital statistics clerk..... | 840 |
| 1 telephone clerk..... | 480 |
| 1 laboratory attendant (part time)..... | 180 |
| Total..... | 12,460 |
| Transportation, office, and dispensary supplies, etc..... | 4,540 |
| | 17,000 |

It will be noticed that the above scheme contemplates the employment of 5 additional employees, namely a bacteriologist, 2 public-health nurses, a food inspector, and a telephone clerk and stenographer; the transfer of the plumbing inspector to a building division of the engineering department; the continuance of the work of treating the indigent sick, which the health department is now required to do; and the transfer of the poundmaster.

| | General admin- istration. | Epidemiology. | Laboratory. | Visiting nurse. | Milk inspec- tion. | Vital statistics. | Sanitation. | Plumbing in- spection. | Education. | Dispensary and treatment of the indigent sick. | Total. |
|---|------------------------------|---------------|-------------|-----------------|-----------------------|-------------------|-------------|---------------------------|------------|--|-----------|
| Badges..... | | | | \$5.50 | | | \$2.75 | | | | \$8.25 |
| Binding..... | | | | | | \$6.00 | | | | | 6.00 |
| Books..... | \$5.00 | | | | | | | | | | 5.00 |
| Drugs, chemicals, and disinfectants..... | | \$257.40 | \$17.14 | | | | | | | | |
| Electrical supplies..... | 3.00 | | | | | | | | | \$128.12 | 402.66 |
| Emergency services..... | | 3.00 | | | | | | \$3.73 | | | 6.73 |
| Exhibit..... | | | | | | | | | | | 3.00 |
| Ice..... | | | 21.00 | | | | | | \$11.50 | | 11.50 |
| Laboratory supplies..... | | | 100.02 | | | | | | | | 21.00 |
| Maintenance of people in quarantine..... | | 57.03 | | | | | | | | | 100.02 |
| Medical supplies..... | | | | | | | | | | | 57.03 |
| Miscellaneous..... | | 9.33 | | | | | | | | 45.10 | 45.10 |
| Nursing supplies..... | | | | 10.00 | | | | | | | 9.33 |
| Office supplies..... | 4.90 | 1.20 | | 4.50 | | | | | | | 10.00 |
| Postage..... | 35.00 | | | | | 1.50 | | | | .60 | 12.70 |
| Printing..... | | 33.90 | 10.75 | | \$21.25 | | 11.75 | 10.00 | | | 45.00 |
| Salary..... | 2,143.37 | 1,621.22 | 153.60 | \$94.61 | 1,200.00 | \$31.59 | 793.12 | 1,400.00 | | 1,621.23 | 8,658.74 |
| Scientific apparatus..... | | | 14.00 | | | | | | | | 14.00 |
| Specimen outfits..... | | | 9.80 | | | | | | | | 9.80 |
| Stationery..... | 45.45 | 15.00 | | | | 1.25 | | | | 2.75 | 64.45 |
| Transportation..... | 210.30 | 105.15 | | | 2617.97 | | | 60.00 | | 105.15 | 1,098.57 |
| Typewriters and re- pairs..... | 7.70 | | | | | | | | | | 7.70 |
| Vaccine..... | | 10.20 | | | | | | | | | 10.20 |
| Total..... | 2,454.72 | 1,113.43 | 326.31 | 914.61 | 1,839.22 | \$40.34 | \$07.62 | 1,575.23 | 11.50 | 902.95 | 10,785.93 |

¹ One-half of salary and transportation charged against epidemiology and one-half against treatment of the indigent sick.

² Includes the cost of one new machine.

RECOMMENDATIONS.

As a result of the foregoing study and after careful consideration of conditions, certain conclusions have been reached which have been made the basis of the following recommendations:

1. That a full-time bacteriologist be employed at not less than \$1,000 a year.
2. That the nursing staff be increased by the addition of two public-health nurses, each to receive a salary of not less than \$900 a year.
3. That a telephone clerk be added to the staff of the health department.
4. That a food inspector be employed at not less than \$900 a year to work under the supervision of the milk and dairy inspector.
5. That the board of education employ one more nurse and attach its staff of nurses to the health department.
6. That the antituberculosis league employ a nurse instead of an investigator and attach her to the health department.
7. That the city be divided into seven districts and a nurse placed in each district to perform within that district all of the duties required of a public-health nurse, including post and prenatal work, infant welfare work, school nursing, and services required in the control of the communicable diseases.
8. That the work of the infant welfare society be taken over by the health department.
9. That a nurse follow up every birth reported to the health department, and that she be provided with a "certificate of registration" to present to the parents, this certificate to be furnished by the health department; and that activities concerned in the conservation of child life be carried on during the entire year.
10. That provision be made in the new wing of the city hospital for the care of infants.
11. That an isolation hospital of not less than 30 beds be constructed on the site of the old hospital; that it be used for the isolation of all communicable diseases (including smallpox) except tuberculosis.
12. That the isolation hospital be under the supervision of the city hospital, but that the admission and discharge of patients be placed under the control of the health officer.
13. That typhoid fever be made a placardable disease, and that disinfectants be issued free of charge to families in which there is a case of that disease.
14. That all children be required to be vaccinated against smallpox before entering the public or parochial schools.
15. That all surface wells and privies be abolished within the city limits.

16. That the city water supply be treated by chlorination before it is delivered to the consumer.

17. That daily bacteriological examinations be made in the laboratory of the health department of the city water supply.

18. That all of the milk of the city of Springfield be pasteurized before delivery to the consumer.

19. That the standard for pasteurized milk shall be as follows: That it be heated rapidly to a temperature of 145° F. and held at that temperature for 30 minutes; that it be cooled immediately to a temperature of 50° F. or lower and promptly bottled; and that it contain not more than 50,000 bacteria per cubic centimeter when delivered to the consumer.

20. That milk from dairies which do not score 60 or above be excluded.

21. That milk be transported from producer to distributor in sealed cans, and that only bottled milk be sold to consumers.

22. That the board of education appoint the health officer as a member of its teaching staff to lecture to the pupils of the high and grammar schools on the subject of public health, and that the pupils be required to pass an examination on that subject upon the completion of the course.

23. That the health department issue a weekly bulletin on the subject of the lecture, a copy to be given to each pupil.

24. That the city install as soon as practicable a modern disposal plant for the treatment of sewage, a chlorine plant for the treatment of the water supply, a municipal abattoir and an incinerator for the disposal of garbage.

25. That thorough and comprehensive study be made looking toward the development of a satisfactory water supply for the city.

26. That ordinances be passed requiring the proper disposal of manure and stable refuse and the cutting of weeds.

27. That the sanitary inspector be authorized to devote his entire time to those matters which have a direct bearing on the spread of communicable disease, including the abolition of surface wells and surface privies, the proper disposal of manure, and the requirement that all householders provide themselves with a garbage can.

28. That the police department lend its cooperation by making it a duty of the patrolmen to abate those nuisances which have no direct bearing on the spread of communicable disease, such as ash piles or other accumulations of rubbish, unsightly matters in general, weeds, chicken yards, slop water, bad odors, etc.

29. That the plumbing inspector be transferred to a building division or the engineering department.

30. That the poundmaster be transferred to the service department.

31. That as soon as practicable the city inaugurate a system of garbage and refuse collection, including manure.

32. That not less than \$17,000 be appropriated to the health department to be spent as outlined in the body of the report.

33. That in the building code, now being written, ample provision be incorporated to prevent block congestion and overcrowding of houses; to regulate the construction and use of tenement and lodging houses, etc.; to require ample toilet and bathing facilities and sewer connections, etc.

34. That certain changes be made in the system of filing records in the department and that there be added to this file a record of expenses.

35. That the work of the department be systematized and that rules be published showing the exact duties, authority, and jurisdiction of the various employees.

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UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, SURGEON GENERAL

**PUBLIC HEALTH ADMINISTRATION
IN QUINCY, ILL.**

BY

CARROLL FOX

Surgeon, United States Public Health Service

REPRINT No. 427

FROM THE

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PUBLIC HEALTH ADMINISTRATION IN QUINCY, ILL.¹

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of public health organization and administration in the city of Quincy, Ill. The study includes investigations in both the office and the field and was carried on throughout a period of about two weeks, from April 16, 1917, to May 1, 1917.

Quincy is situated on the Mississippi River and is the county seat of Adams County. It is about 262 miles southwest of Chicago and about 100 miles west of Springfield.

It is served by two systems of railroads—the Chicago, Burlington & Quincy Railroad, and the Wabash—and by steamboat packets plying on the Mississippi River.

Quincy is provided with a beautiful park system and its topography is such that from the standpoint of city planning and the city beautiful the possibilities are great.

Quincy is a manufacturing center, and is surrounded by agricultural country. Among its industries of magnitude may be mentioned the manufacture of stoves and ranges, governors and pumps, farm machinery and implements, elevators, strawboard, incubators, furniture and fixtures, wagons, automobile bodies, breakfast foods, flour, shoes, boilers and structural steel, etc.

The population of Quincy, as estimated by the United States Census Bureau for July 1, 1916, is 36,798, there being an increase of population over the census of 1910 of but 204.

For information and assistance received while making the study, I am indebted to the officials of the health and other city departments, and to other citizens interested in the welfare of the community.

ORGANIZATION AND ADMINISTRATION.

The city of Quincy is governed by a mayor and council.

The health organization of the city is known as the health department, and is under the control of a board of health, comprising two physicians and two councilmen, appointed by the mayor, and the chief of police, who is president of the board. Subordinate to the board of health, there are a commissioner of health, who is appointed by the mayor, and a clerk, appointed and paid by the commissioner. The employees engaged in the collection of garbage are paid from health-department funds. In addition, the switchboard operator of the police department is classified as secretary of the

¹ Reprint from the Public Health Reports, vol. 32, No. 40. Oct. 5, 1917, pp. 1665-1679.

board of health and paid from health-department funds, but his duties are in no way concerned with the health department. The chief of police, as president of the board, receives an allowance of \$150 per annum from health funds.

Commissioner of health.—The commissioner of health is a full-time official who receives \$660 per annum. In addition, he is given certain allowances amounting to \$460, out of which he must pay the salary of his clerk (\$360). As local registrar, he receives the customary fees from the county.

The commissioner is not a physician, and his experience has been gained during the four years in which he has occupied the position. His duties are principally concerned with the enforcement of law and regulations relating to the control of the communicable diseases, the abatement of nuisances, and food inspection.

Office hours of the health department.—The health department is provided with two rooms in the city hall. The office remains open from 8 a. m. until 5 p. m. every day except Sundays and holidays. At such times the commissioner is usually present at least a part of the day. By arrangement, undertakers may secure burial permits when the office is closed.

Transportation.—The commissioner of health has provided himself with a horse and buggy which is maintained at the expense of the city in the barn provided for the housing of the equipment used in garbage collection.

Dissemination of information.—The campaign of education in public health, so necessary in every community, has been overlooked in Quincy. With a reorganization of the health department, this matter should be gone into intensively.

Discussion.—It is certain that the health department of Quincy is not in a position to perform the duties required of a modern health department. Its organization is bad; it is without money and men. The board of health should be abolished and a full-time health officer appointed to be directly responsible to the mayor, and to hold his office during efficiency. He should have previous experience in public health work, and should be a physician in order to carry on the professional work that will be referred to later on. He should not be permitted to engage in the private practice of medicine. The health officer should have the same standing in the city government as other officers in charge of departments, as, for instance, the chief of police, the chief of the fire department, etc.

He should immediately inaugurate a campaign of education by talks at various places and newspaper articles, so that the people may become familiar with the work and aims of the health department and their cooperation be secured. Without the cooperation of the people a health department can accomplish little.

The health officer should be made registrar of births and deaths.

REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths is carried on under the authority of State law. The commissioner of health has been appointed local registrar for the city of Quincy and the township of Riverside.

Original certificates are transmitted to the State board of health, copies are made in a book for the files of the local health department, and transcripts are filed with the county clerk annually.

Registration of deaths.—Six hundred and ten deaths were reported as occurring in the city of Quincy during the year 1916, making an indicated crude death rate of 16.5 per thousand. Three hundred and seventeen deaths, or 52 per cent, were due to causes that might be classed as preventable.

There were registered during the same period 57 deaths in children under 1 year of age, indicating an infant mortality rate of 96.6 per thousand registered births.

Registration of births.—Five hundred and ninety births were reported as occurring in the city of Quincy during the year 1916, making an indicated birth rate of 16 per thousand. The birth rate is less than the death rate, signifying that not all births occurring in the city are reported. This is a matter for careful investigation by the health authorities.

| Diseases. | Total preventable deaths, all ages, registered. | Indicated death rate per 100,000 population. | Number cases reported. | Fatality rate per 100 cases. | Total registered deaths, infants under 1 year. |
|--|---|--|------------------------|------------------------------|--|
| Tuberculosis, pulmonary..... | 65 | 176.6 | 0 | ..... | 0 |
| Tuberculosis, other forms..... | 8 | ..... | 0 | ..... | 0 |
| Typhoid fever..... | 2 | 5.4 | 7 | 28.5 | 0 |
| Diphtheria..... | 6 | 16.3 | 45 | 13.3 | 1 |
| Measles..... | 12 | 32.6 | 804 | 1.5 | 1 |
| Scarlet fever..... | 0 | 0 | 7 | ..... | 0 |
| Whooping cough..... | 1 | ..... | 0 | ..... | 0 |
| Influenza..... | 16 | 43.4 | ..... | ..... | 1 |
| Tetanus..... | 2 | ..... | ..... | ..... | 0 |
| Infantile paralysis..... | 1 | ..... | 0 | ..... | 0 |
| Erysipelas..... | 1 | ..... | 2 | ..... | 0 |
| Pneumonia..... | 69 | 187.5 | ..... | ..... | 8 |
| Chicken pox..... | 0 | ..... | 54 | ..... | 0 |
| Smallpox..... | 0 | ..... | 2 | ..... | 0 |
| Septicemia..... | 4 | ..... | ..... | ..... | 0 |
| Meningitis..... | 6 | ..... | 1 | ..... | 1 |
| Diarrhea and enteritis..... | 9 | ..... | ..... | ..... | 3 |
| Syphilis..... | 4 | ..... | ..... | ..... | 0 |
| Bronchitis..... | 13 | ..... | ..... | ..... | 4 |
| Occupational accidents and diseases..... | 3 | ..... | ..... | ..... | 0 |
| Other accidents..... | 15 | ..... | ..... | ..... | 0 |
| Malignant growths..... | 42 | 114.1 | ..... | ..... | 0 |
| Premature..... | 14 | ..... | ..... | ..... | 14 |
| Malnutrition..... | 5 | ..... | ..... | ..... | 5 |
| Other causes..... | 19 | ..... | ..... | ..... | 19 |
| Total..... | 317 | ..... | ..... | ..... | 57 |

EPIDEMIOLOGICAL ACTIVITIES.

The Report of Diseases.

Diseases are reported under the authority of State law and regulations of the State board of health.

Physicians report the occurrence of a notifiable disease by telephone. The information obtained is entered in a book which shows the name of the disease, date, name, age, sex, color, and address of patient and the physician's name.

In the case of smallpox, scarlet fever, diphtheria, epidemic cerebrospinal meningitis, poliomyelitis, typhoid fever, bubonic plague, cholera, yellow fever, and typhus fever, a report is made to the State board of health on a special form or by telegraph followed by letter within 24 hours after notification by the physician. Other diseases are reported to the State board of health monthly.

The Control of Disease.

The reportable diseases are placed in two classes as follows:

TO BE QUARANTINED AND PLACARDED.

| | |
|-----------------------------|-------------------------------|
| Smallpox. | Cerebrospinal fever. |
| Scarlet fever. | Meningitis (epidemic). |
| Scarlatina. | Asiatic cholera. |
| Diphtheria. | Bubonic plague. |
| Membranous croup. | Leprosy. |
| Chicken pox. | Typhus fever. |
| Measles. | Yellow fever. |
| Whooping cough. | Rocky Mountain spotted fever. |
| Poliomyelitis (acute inf.). | |

SUBJECT TO A MODIFIED QUARANTINE.

| | |
|------------------------|------------------------|
| Typhoid fever. | Ophthalmia neonatorum. |
| Paratyphoid fever. | Trachoma. |
| Dysentery (amebic). | Pellagra. |
| Dysentery (bacillary). | Puerperal fever. |
| German measles. | Rabies (hydrophobia). |
| Mumps. | Tetanus. |
| Septic sore throat. | Glanders. |
| Malaria. | Anthrax. |
| "Continued fever." | Trichinosis. |
| Hookworm disease. | Actinomycosis. |
| Tuberculosis. | |

Typhoid fever is a placardable disease.

There is practically no epidemiological study made of any disease and there are no epidemiological records on file in the board of health. The commissioner of health placards the house, enforces the quarantine, and performs the terminal fumigation and other procedures required by regulations of the State board of health.

A certificate is furnished to children giving them authority to return to school after quarantine has been raised.

Typhoid fever.—During the year 1916 there were seven cases of typhoid fever reported with but two deaths. One death occurred in a case that was introduced from the outside. Including this case, the death rate from typhoid fever was but 5.4 per 100,000. The city has used filtered water for many years, but previous to 1914 the plant was of an old type and the intake was badly located with reference to a sewer outlet, and typhoid fever was more or less prevalent. During the year 1913 there were 24 deaths from typhoid fever apparently originating in the city, making a death rate of 65.4 per 100,000 population. Upon investigation, sewage was found to be gaining admission to the intake pipe; this was corrected by extending the pipe out some distance into the river. In 1914 a new filter plant was put into operation. Since the institution of these changes the typhoid death rate has steadily decreased. At the present time Quincy is fortunate in having a good city water supply and but few surface wells. The insanitary privy and the manure pile, however, are common, and it is believed that by eliminating the two latter sources of danger and requiring the pasteurization of all milk, Quincy could establish an enviable record as regards typhoid fever.

Tuberculosis.—The registered death rate from pulmonary tuberculosis during the year 1916 was 176.6, there having been 65 deaths reported. During the same period there were 8 registered deaths from other forms of tuberculosis, making an indicated death rate from tuberculosis, all forms, of 198.3 per 100,000 population. This death rate is very high and shows the necessity for the health department to carry on active work along the line of tuberculosis prevention.

There is at present no place for the isolation of the tuberculous, but plans are laid for the construction of a county sanatorium in the near future.

At one time the local Antituberculosis Society operated a dispensary and employed a nurse. This commendable effort to do something for the people was not appreciated, however, and for lack of support and patronage the work was discontinued.

Other diseases.—Next to tuberculosis, all forms, pneumonia gave the highest number of registered deaths, with a death rate of 187.5 per 100,000 population, followed by malignant growths with a death rate of 114.1; influenza 43.4; measles 32.6 and diphtheria 16.3.

There were but two cases of smallpox reported during 1916, although during the year 1915 there were 300 reported cases. There were no deaths.

The isolation hospital.—The isolation hospital is a 10-room brick structure, pleasantly located in one of the city parks. Its capacity is about 30 beds and segregation could be readily secured. It is now used for the isolation of smallpox only. It is not provided with modern plumbing; water is derived from a cistern but is not supplied under pressure. Sewage is disposed of in an insanitary privy. At

present there are no patients undergoing treatment in the hospital. At the time of inspection the building was in a disgracefully dirty condition. No caretaker is provided.

One of the local hospitals of the city has constructed an isolation hospital on its grounds to be used for the isolation of any communicable disease that may develop within the institution. Outside cases are occasionally taken at the rate of \$5 per day. This isolation hospital will accommodate about eight patients.

Public health nursing.—There is but one nurse in the city engaged in work of this kind and she is employed by the Cheerful Home, a charitable organization which cares for children whose mothers go out to work during the day. This nurse is principally engaged in prenatal and child welfare work and to some extent in the activities concerned with antituberculosis work.

Diagnostic Laboratory.

There is no diagnostic laboratory, but a laboratory for the bacteriological examination of water has been fitted up in the building occupied by the water purification plant. Water examinations are now made by the superintendent of the water works.

Discussion.

Having provided for a health officer it then becomes necessary to furnish him with machinery and men to carry on the work of his department efficiently and effectively.

In order to control the communicable diseases it is necessary to exercise careful supervision over the sick person, for it is the individual suffering with a communicable disease or harboring the causative organism who is the real danger to the community. He it is who spreads his infection through the fresh discharge from his mouth, nose, throat, intestines, etc., to those with whom he comes in contact.

There are therefore needed, a bacteriologist and a staff of public health nurses. This staff should be composed of two nurses to be paid by the health department, one nurse to be paid by the school board, and the nurse employed by the Cheerful Home. A combination of this kind, a correlation of public health nursing functions so that all are centralized under one directing head, is in line with modern ideas on the subject.

The equipment in the water laboratory at present used by the water department should be added to and the laboratory transformed into a diagnostic laboratory to be used by the bacteriologist for the mutual benefit of the water and the health departments.

In addition to the above, there is also required a sanitary inspector, whose duties are the abatement of nuisances which have a direct bearing on the public health, as for instance insanitary privies and

accumulations of manure. In a report of this kind, it is not practicable to go into details as regards the duties of the various officials.

There are also needed two hospitals, one for the isolation of the tuberculous and one for the isolation of cases of other communicable diseases. Plans are already laid for the first. The second could readily be obtained by utilizing the hospital at present used for small-pox only. The building needs some repairs and a modern sewage disposal system and water supply. It could readily be converted into a very satisfactory isolation hospital.

The health department should also operate an antituberculosis as well as a child-welfare dispensary, with the health officer and a nurse in attendance during dispensary hours.

MUNICIPAL ENGINEERING ACTIVITIES.

The Disposal of Garbage and Refuse.

Garbage is collected by the city and disposed of by dumping into the Mississippi River.

The equipment consists of five covered wooden wagons of about $2\frac{1}{2}$ cubic yards capacity each. The number of wagons actually in use depends upon the time of year. There are also 10 horses maintained by the city. These have been transferred from the fire department and are stabled in a rented barn. The number of men employed on the wagons depends upon the number of wagons in use. Each receives \$2 per day while actually employed. The barn man receives \$40 per month.

Collections are made rather irregularly, perhaps, once a week, from residences only. The service is discontinued during bad weather. Commission houses, grocery stores, butcher shops, and the like must have garbage removed at their own expense. Garbage from hotels and restaurants is usually taken by farmers and fed to hogs.

During the year 1916 there were removed 1,930 loads of garbage. This is the only figure available, but for practical purposes it may be estimated to represent about 3,136 tons, or about one-half of the garbage actually produced in the city. During the same period there was spent by the board of health for garbage collection, \$5,229.13, or \$2.70 per load, approximating \$1.66 per ton collected.

Inspection of the city shows that many householders have neglected to provide themselves with proper garbage receptacles.

The health department is also made responsible for the removal of dead animals. Carcasses of large animals are removed by a private rendering establishment. Carcasses of small animals are removed by the health department.

There is no ordinance providing for the care and disposal of manure. In the stables inspected, manure was found to be handled in a very careless manner with every opportunity for the breeding of flies.

There is no provision made for the collection of rubbish except at the annual clean-up.

Discussion.—The city should organize a service department to have charge of the cleaning of streets and the collection and disposal of garbage and rubbish, dead animals, and night soil.

The present methods of garbage collection should be improved and amplified. All garbage should be collected and disposed of by incineration. This would mean an increase in equipment and the erection of an incinerating plant. The provisions of State law authorizing cities under 100,000 to levy a 2-mill tax for this purpose should be utilized. At the same time a system of rubbish collection, including manure, should be inaugurated, and rubbish collected regularly. Rubbish should be used to fill in the low places within the city limits. Valuable land may be reclaimed in this way. A man should be employed to supervise the dumping so that a nuisance may be avoided.

The State board of health is in a position to give valuable advice relative to matters concerning garbage and rubbish collection and disposal, and it should be called upon for assistance before any final action is taken.

Water Supply.

The water supply of the city is derived from the Mississippi River. The intake is located well away from any sewer outlet. The water is pumped into coagulation basins, of which there are two used in series. From two and one-half to seven grains of alum are used as the coagulant, part of it being introduced in the first basin and part in the second. There are six filter beds, modern in construction. The plant has a capacity of six million gallons a day. For present needs one and one-half million gallons suffices. Water is furnished to the city under direct pressure and from a storage and distributing reservoir with a capacity of eighteen million gallons. Filtration is supplemented by the use of chlorine. By this combined method of treatment the efficiency of the plant runs from 97 to over 99 per cent. Daily bacteriological checks are kept on the process in a laboratory which has been fitted up in the building occupied by the plant. These bacteriological examinations are made by the superintendent of the water works. Monthly examinations are made in the State laboratory at Urbana.

Cistern water is used in the city, but the surface well is the exception rather than the rule.

Disposal of Sewage.

The city of Quincy is elevated well above the level of the river and natural drainage is therefore good. It is fairly well provided with sewers, both storm water and sanitary, except in a section which, because of its topography, can not be drained into the present

system and which will require the construction of a separate sewer system. The storm water and waste from this section of the city are at present being carried off by natural channels. Sewers empty their contents into the Mississippi River untreated.

There are throughout the city a number of houses using cess-pools, and also a number connected to the sewer through the catch-basin system similar to the method that has been described for Toledo, Ohio.¹ A sewer connection of this kind is no better than a cesspool; both should be eliminated and proper sewer connections insisted upon.

A plumbing inspector has been employed by the city since June 30, 1914. During this time there have been 485 buildings connected to the city sewers with complete bathroom installation, flush closet, tub, and lavatory. Two hundred and eighty of these connections were in new and 205 in old buildings.

In requiring sewer connections for houses owned by the poor it might be pointed out that such could be made by the city and plumbing installed, using the same procedure as that used in street construction, namely, charging the cost of same as a lien against the property and permitting the property holder to pay on easy installments.

It is a common practice to connect downspouts with the sanitary sewers. This should be discontinued by city ordinance, as these sewers have not been planned to carry the additional burden.

HEALTH SUPERVISION OF SCHOOLS.

At one time the board of education employed a school nurse in an attempt to exercise some health supervision over the pupils of the public schools, but because of the discouraging attitude of the people the work was discontinued and has never been resumed. Work of this kind is not likely to be received with favor until the people are educated up to it; then they would not do without it. The work should be carried on again by the school authorities in cooperation with the health department. The school board should operate a dental and an eye, ear, nose, and throat clinic and engage the services of a dentist and a specialist to perform the necessary work for pupils whose parents can not afford to pay for it. The school board should also employ a nurse and attach her to the health department, this nurse and the other nurses of the health department, together with and under the supervision of the health officer, to exercise a general supervision over the health of pupils of public and parochial schools in addition to performing other work of a public-health nature.

It would also be well for the school authorities to establish an open-air school, or at least an open-air class.

¹ Public Health Reports, June 25, 1915, p. 1890. Reprint No. 284, p. 22.

FOOD INSPECTION.

The commissioner of health, in addition to his other duties, exercises some supervision over the milk supply as well as over other foods and places handling foods. It is obvious, however, that one man can not carry on all of the activities of a health department except superficially.

The milk supply.—An ordinance has recently been passed by the city council providing for the maintenance of the purity of milk. In this ordinance provisions are made for the licensing of milk dealers; for the inspection of producing farms or other places handling milk; for the collection of samples; and for the labeling of cans, bottles, wagons, etc. It is required that milk must be sold in original containers; that barns must be properly lighted and ventilated; that they must have a floor of impervious material, etc.; and that there must be a separate milk house. Adulterated milk is defined and provision is made for exclusion where milk comes from diseased cows or where a person handling the milk is suffering from a communicable disease, etc.

There are said to be 125 farms supplying milk to Quincy. A few of these farms were inspected. None of them would score very high; some were very primitive. The impression was obtained, however, that most of the producers were willing to accept suggestions, and that a good dairy inspector, through cooperation, could succeed in getting them all to apply the principles of cleanliness, thus producing a clean milk with a minimum expense for equipment, alteration, or new construction.

To produce a milk free from the possibility of transmitting disease, pasteurization should be insisted upon. At present there are three pasteurizing plants in the city, all using the holding method. By careful technique, all should be able to furnish a safe milk.

Other foods.—There are three slaughterhouses located within and just without the city limits. These were inspected. No ante or post mortem inspection of cattle is performed. Butchers are permitted to do some slaughtering on their premises.

Various places handling foods, including restaurants, butcher shops, and bakeries, were inspected. Generally speaking, sanitation was fairly good within the establishments except that occasionally a toilet in bad condition was encountered or a poorly located toilet compartment. Inadequate and improper means for the disposition of garbage and rubbish was a common observation.

Discussion.—In addition to the employees that have already been mentioned, there should be provided a dairy and food inspector, whose duty it would be to maintain a general supervision over foods, especially milk, and places handling foods. This would include the inspection of the producing farms, transportation of milk to the milk

plant, the supervision over the methods used in the pasteurizing plants, and the collection of samples for analysis in the laboratory. Producing farms should be scored, laying more importance upon the methods than equipment. All places handling food products should be scored at irregular intervals. All scores should be published in the daily papers.

All milk should be pasteurized by the holding method before being delivered to the consumer.

A municipal abattoir should be erected in which should be slaughtered all animals killed locally for human consumption.

APPROPRIATIONS AND EXPENDITURES.

There was appropriated to the health department for the fiscal year 1917 the sum of \$7,550.

This may seem like a fair appropriation to the health department until it is explained that of the above amount \$840 represents the salary of a switchboard operator for the police department; \$150 is an allowance made to the chief of police for services as president of the board of health; \$5,350 is to defray the expenses of garbage collection. This leaves but \$1,210 actually spent in the prevention of disease and represents but one-half of 1 per cent of that part of the revenues of the city appropriated for ordinary operation and maintenance of city government (\$234,857), as against 21.3 per cent for fire and 15.8 per cent for police protection. The health department of the city of Quincy has never been properly organized, nor has it ever received sufficient money or encouragement to perform active public health work along modern lines. The health department is entitled to at least 5 per cent of the available revenues of the city, which would amount to about \$12,000. With this sum there could be organized a small but efficient health department as follows:

| | |
|--|----------|
| 1 commissioner of health and local registrar..... | \$2, 000 |
| 1 dairy and food inspector..... | 900 |
| 2 public-health nurses, at \$900 each..... | 1, 800 |
| 1 bacteriologist..... | 1, 000 |
| 1 sanitary inspector..... | 900 |
| 1 clerk and stenographer..... | 720 |
| To maintenance of office, transportation, laboratory, dispensaries, etc..... | 4, 680 |
| Total..... | 12, 000 |

It will be noticed that the above amount does not provide for the collection or disposal of garbage. This activity should not be paid for out of health department funds. There is a law in the State of Illinois which permits a municipality to levy a special tax of not to exceed 2 mills to be expended in the collection and disposal of garbage. This privilege should be made use of by the city.

RECOMMENDATIONS.

As a result of the foregoing study and after careful consideration of conditions, certain definite conclusions have been reached and are made the basis of the following recommendations:

1. That the board of health be abolished.
2. That there be appointed a full-time health officer, to be made directly responsible to the mayor; that he receive not less than \$2,000 per annum; that he hold his position as long as he renders efficient services to the city; that he be a physician who has had previous experience in public-health work; that he be required to perform the administrative, epidemiological, and professional duties required in a health department, and that he be prohibited from engaging in the private practice of medicine.
3. That the health officer be permitted to enforce the health ordinances of the city and to carry on his work untrammelled by political considerations and without fear or favor.
4. That he be furnished with the following assistants: One bacteriologist, at not less than \$1,000 per annum; two public-health nurses, at not less than \$900 per annum each; one dairy and food inspector, at not less than \$900 per annum; one sanitary inspector, at not less than \$900 per annum; one clerk and stenographer, at \$720 per annum.
5. That as soon as appointed the health officer start an educational campaign by lectures, talks, newspaper articles, etc., so that the people may be informed as to the aims of the health department and their cooperation secured.
6. That the laboratory equipment in the building occupied by the filtration plant be increased and used jointly by the water department and the health department.
7. That the bacteriologist be required to perform the daily examinations of the water supply of the city, the bacteriological and chemical analyses of milk, the examination of samples submitted in suspected cases of typhoid fever, diphtheria, tuberculosis, gonorrhea, etc., and such examinations as may be necessary to detect carriers, or to determine the release from quarantine.
8. That the school authorities institute a health supervision of schools, including the operation of a dental and an eye, ear, nose, and throat clinic, and the employment of a visiting nurse. That the visiting nurse be attached to the nursing staff of the health department to work with and under the supervision of the health officer.
9. That the nurse employed by the Cheerful Home be attached to the health department to work with and under the supervision of the health officer.
10. That the city then be divided into four districts, and a nurse placed in each district to perform within that district all of the duties

of a public health nurse, i. e., the activities relating to the control of the communicable diseases, including tuberculosis, and the work involved in the conservation of child life, including school nursing.

11. That the health department operate a child welfare and anti-tuberculosis dispensary for the benefit of the poorer population of the city. That this dispensary be open at a definite hour of the day as many days in the week as may be necessary and that one of the nurses be in attendance during such time as the dispensary is open.

12. That the professional services at the dispensary be furnished by the health officer.

13. That the health officer be not required to furnish professional services at the city jail, or at the homes of the indigent sick, but that the present arrangement with the county physician be continued.

14. That section 165 of Article V of the Revised Ordinance of the City of Quincy, requiring vaccination of children as a prerequisite to admission to school, be enforced.

15. That in the case of diphtheria, quarantine be released only after finding two successive negative cultures from the throat and nose.

16. That antituberculosis supplies be issued free of charge in the case of tuberculosis and that disinfectants be issued free of charge in the case of typhoid fever.

17. That the physicians of the city make every effort to report promptly all notifiable diseases, including tuberculosis, and all births and deaths occurring in the city.

18. That the present isolation hospital be renovated, placed in good sanitary condition, and used for the isolation of all communicable diseases that can not be properly isolated in the home.

19. That the county tuberculosis sanatorium be erected without delay, and that it have not less than 50 beds.

20. That the duties of the dairy and food inspector be, to have supervision over the milk supply of the city (producing farms, pasteurizing plants, collection of samples, etc.), and in general the inspection of foods and places selling foods.

21. That the milk supply of the city of Quincy be pasteurized by holding it at a temperature of 145° F. for 30 minutes, followed immediately by cooling and bottling.

22. That the sanitary inspector be made responsible for the elimination of the insanitary privy, the proper handling of manure, the requirement that all householders furnish themselves with a proper garbage tin, and the elimination of stagnant water, breeding mosquitoes.

23. That the abatement of all other nuisances which do not have any direct bearing on the public health be made a duty of the police department.

24. That the sewers be extended to all parts of the city as soon as possible and that where a sewer is available, proper sewer connections be required without delay.

25. That in houses owned by the poor the health department be authorized and money appropriated to have the necessary plumbing installed and sewer connections made, the cost of same to be charged as a lien against the property, permitting the house owner to pay in easy installments.

26. That where a sewer is not available the construction of a "sanitary" privy be permitted; the type of privy to be approved by the State board of health.

27. That the citizens of the community cooperate actively with the health department in its effort to control disease and enforce sanitary measures.

28. That inexpensive automobile transportation be furnished to the dairy and food inspector and to the health officer to be used in the field work of the department.

29. That there be appropriated for the support of the health department \$12,000 per annum.

30. That there be organized in the city government a service department to have charge of the cleaning of streets and alleys and the collection and disposal of garbage, rubbish, manure, dead animals, and night soil.

31. That as soon as practicable the city erect an incinerating plant for garbage and a municipal abattoir.

32. That the system of garbage collection be improved and amplified and that a system for the collection of rubbish be inaugurated.

33. That the provisions of the State law authorizing a city of less than 100,000 population to levy a tax of 2 mills to be used in the collection and disposal of garbage be utilized by the city of Quincy.

34. That a building division be organized in the engineering department to have supervision over the construction of new buildings or alterations made to old buildings.

35. That before any such work can be started, plans must be submitted to and must receive the approval of the building division.

36. That a housing code be adopted by the city regulating the construction of all buildings, including tenements, hotels, apartment houses, etc., as to the toilet facilities, light, ventilation, drainage, and all matters relating to the health and safety of the occupants.

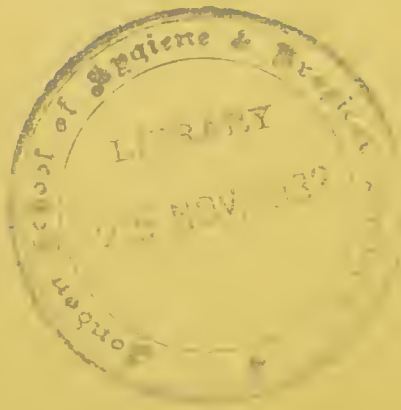
37. That the plumbing inspector be placed in the building division.

DO NOT DESTROY—

*When you have no further use for this
pamphlet give it to someone else.*







W. 628

